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features

JULY/AUGUST 1997

Buy me, p. 110

Last Tour of the **Tucson** House **74**

The finished Tucson project is one sweet hacienda. Join us for a private viewing of the lush courtyard, the Spanish parapets, the master bedroom suite, the lap pool, the two kitchens—and secret spaces most guests will never see. By Jack McClintock

Absolute **a/c** **82**

The most refreshing idea in air-conditioning mates two old technologies—the internal combustion engine and the heat pump—into an ingenious chiller that cuts cooling bills in half. By Jack McClintock

Bring Home the **Farm** **88**

Forget dogs—get the kids a few chickens. Building a backyard poultry palace is fun for the whole family, and you won't believe it when you taste fresh eggs. By Jeanne Huber

An American **Craftsman** **94**

A chain-smoking, tool-toting tough guy seems an unlikely professor, but men like Robert Reade are the last best hope to teach the art of framing to a new generation. By Walt Harrington

To **Mexico,** for Tile **100**

In the shadow of the Sierra de Guanajuato mountains, Dolores Hidalgo villagers hand-form mud into tiles and paint them one by one. The captivating result celebrates the spirit of the town that sparked the Mexican revolution. By Ron Arias

Dreams Are Made of This **110**

Would you like to own a house Norm has done over? Then take a first, pre-remodeling gander at our next project, a 300-year-old Colonial in Milton, Massachusetts. When we finish, it goes on the auction block. By Brad Lemley

The Poster: **Hinges** **117**

Often ignored, the lowly hinge proves to be haute hardware. By George Nash

In the **Garden** **119**

Russ Morash celebrates the latest wave of smart sprinklers; plus praise for the lowly slug, the criticism of bug zappers and a celebration of big vegetables.

Strap metal, p. 117

PHOTOGRAPHS, CLOCKWISE FROM TOP, BY THIBAULT JEANSON; TOM WOLFF; DAN BORRIS; GRACE HUANG; GARY HUSH

Keeper of the frame, p. 94

Tile and toil, p. 100

A kid's best friend, p. 88

On the cover: This fall's TV project house, a classic Colonial built in the early 1700s, awaits an unusual renovation. Photograph by Thibault Jeanson

(Continued on page 10)

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By Buick

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*Maintenance needs vary with different uses and driving conditions. See Owner's Manual for details. **Mid-size car class as defined by U.S. EPA Interior Volume Index.
†MSRP including dealer prep and destination charge. Tax, license and optional equipment additional. MSRP slightly higher in CA, WA, OR and ID. Competitive MSRPs as reported Feb. 1997.

up front

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What were our parents thinking of when they fell in love with paneling? By Jeanne Marie Laskas

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Clean Machine 31

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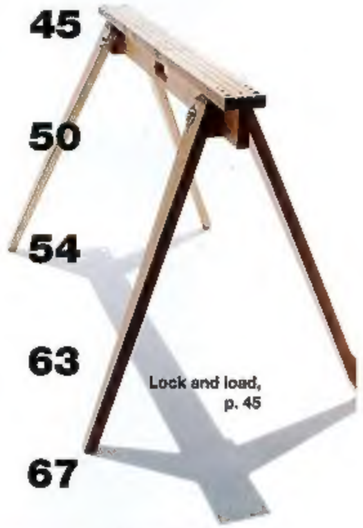

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PHOTOGRAPHS, CLOCKWISE FROM TOP, BY MICHAEL MYERS; JOSHUA MCHUGH; KELLER & KELLER; DARRIN HADDAD

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contributors
JULY/AUGUST

On this, her first shoot for *This Old House*, **GRACE HUANG** (photographer, "Bring Home the Farm") encountered a dozen raucous children and even more chickens. Raised in Vermont and upstate New York, she has a degree in photography and received additional training at l'École Nationale de la Photographie in Arles, France. She has lived in New York City for four years, working for publications such as *Mademoiselle*, *Shape* and *Condé Nast Traveler*. **GEORGE NASH** (author, "Hinges") lives in a small town in mid-coast Maine where his wife is the local family doctor. A former building and renovation contractor in Vermont, he has written *Renovating Old Houses* (Taunton Press, 1992), *Do-It-Yourself Housebuilding* (Sterling, 1995) and *Wood Fences* (Taunton, 1997). This summer, he is building a 2,000-square-foot shingle-style house. He figures it'll be about a year before he and his wife move in. (E-mail: gofah@aol.com) **NANCY STEDMAN** (author, "Good Day, Sunshine") spent six years as a reporter and style editor for the *New York Daily News* and went on to be an editor at *Fitness* and *Redbook*. She lives in a 100-year-old converted hayloft in Riverdale, a section of old estates in the Bronx, and studies horticulture nearby at the New York Botanical Garden. (E-mail: stedman@interport.com) Based in Portland, Oregon, **GARY HUSH** (photographer, "Hinges") has produced still-life images for *Mens Journal* and *Outside*, as well as for advertising clients such as Nike and Saturn. His passion is renovating and landscaping his 1912 bungalow, which he has surrounded with 36 old-variety rosebushes and a medicinal and culinary herb garden. (E-mail: Hush@teleport.com)

Help

This Old House On-line
More ideas, more advice, other homeowners to chat with, up-to-the-minute appearance schedules for the crew, updates on the TV project houses. Join us at www.pathfinder.com/TOH/

Letters to the Editor
Got a problem? We can help. Got a gripe? We're listening. Have a happy experience with a supplier or manufacturer? Share the kudos. Contact us via E-mail at Letters@toh.timeinc.com or write to Letters, *This Old House* magazine, 55 East 52nd Street, New York, NY 10022.

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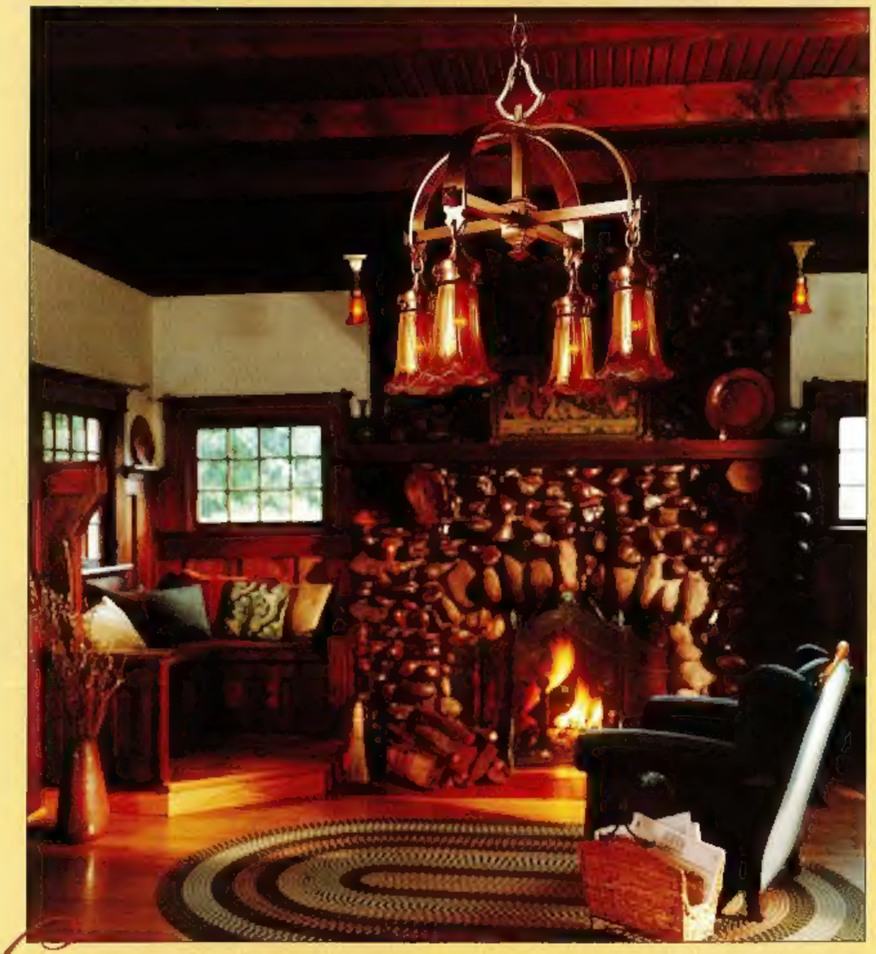
PHOTOGRAPHS, TOP TO BOTTOM: BY CRAIG HARRIS; JANE WATERMAN; COURTESY OF NANCY STEDMAN; KONSTANTINE SPARIS

"There Are Two Kinds of Light—
The Glow That Illumines,
And The Glare That Obscures."
James Thurber



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Letters

In "Ladder Sense" [March/April], Tom Silva said he uses only commercial-grade aluminum ladders. What about magnesium? My three magnesium ladders have served me well. Are they dangerous?

Norman T. Martin Jr.
Chappaqua, NY

As long as it's in good shape, a magnesium ladder has the same advantages—lightness and strength—as aluminum. But Tom warns that doing electrical work on any kind of metal ladder can be deadly. That's why electricians stand on wood or fiberglass.

"For Sale by Owner" in your January/February issue was informative, but it presented only a part of what an owner-seller can do. By offering seller financing, homeowners can improve their chances for success by attracting buyers such as self-employed and retired people who might not qualify for conventional financing. And they won't have to take back the mortgage if they set up a "simultaneous close" and sell the note to an investor at the same time they sell the house.

Kenneth E. Pingel
Salem, OR

I hate to quibble, but in your March/April table of contents you refer to an adobe house "that may last until the next millennium," which is less than three years from now. And in "Our Father's House" in the same issue, we learn that George Washington died "two weeks shy of the millennium in 1799." However, two weeks shy of the millennium would be December 18, 1999, which means George is still alive.

Bill Boland
Philadelphia, PA

It must have been a touch of millennium fever. In the future, we'll keep our turns-of-the-century and millennia straight.

My kitchen cabinets have a tung-oil finish, but it's disappearing fast. I'd like to refinish with polyurethane, but I've heard it can't be done.

Bruce Watson
via E-mail

It can, says *This Old House* painting contractor John Dee. After taking off the doors and removing the hardware, thoroughly sand all the surfaces with 180-grit paper (don't hit the corners too hard). Then wipe with a solvent to remove any polishing wax that may remain. To assure even color, use an oil-based stain (first test it in an inconspicuous place). Apply at least two coats of polyurethane, and between coats sand with 280-grit paper.

I'd like to install a pine plank floor over a concrete slab. Can I use a construction adhesive?

J. L. Hill
via E-mail

Before you put down any flooring, the first step is to block moisture that may come from the slab by covering it with a continuous sheet of polyhutylene. Then fasten 1x4s or ¾-inch plywood to the concrete with masonry anchors or with nails driven by a stud gun. Most solid wood flooring has to be nailed, not glued, in place to straighten bends and flatten twists.

I'm writing on behalf of my 3-year-old son, Evan. Ever since he was 18 months old, he has eagerly awaited each new episode of *This Old House*, and at 2 he was able to identify all of the power tools on the programs. How can I get him a cast photograph?

Dave MacDonald
Edmonton, Alberta

Because of the volume of mail we receive, we can't honor individual requests for photos. But the guys autograph 8-by-10 glossies at their public appearances at home shows, which you can find listed on our Web site (www.pathfinder.com/TOH/).

Your story on compost bins ("The Compleat Composter," January/February) inspired me to get off the couch. I made my own composter out of leftover wood and 12 feet of used chain-link fence. It was inexpensive and 100 percent inspired by Norm's design.

John Roberts
Arlington, VA

punch list

definition: a list of items incorrectly done or remaining to be finished on a construction job

- The cross-linked polyethylene tubing used in plumbing the Tucson project house was inadvertently omitted from the May/June Directory. Aquapex is manufactured by the Wirsbo Co., 5925 148th St. West, Apple Valley, MN 55124; 800-321-4739.
- The telephone number for Ramset, manufacturer of stud guns, was incorrectly listed in the March/April Directory. The correct number is 800-899-7890.
- In the January/February "Letter From This Old House," we incorrectly named John Hathaway as the founder of the Great Atlantic and Pacific Tea Co., today's A&P supermarket chain. The founders were John and George Hartford.

This Old House
...on the road

On a recent trip to Italy, our group, loyal readers of your magazine, was on the alert for *This Old House* sites. The ancient port of Ostia Antica, for instance, provides a wealth of potential. We recommend the staff be given two weeks, all expenses paid, to investigate. To direct you to one of the most promising ruins, we left two TOH hats on a wall. We'd appreciate your returning them.

Howard and Marcia Aduss
Doris and Larry Ashkin
Chicago, IL

We immediately forwarded your excellent recommendation to our editor in chief. While we await his approval, we invite all our readers to put magazines or other items with the TOH logo in similarly appropriate places and send us a photo.

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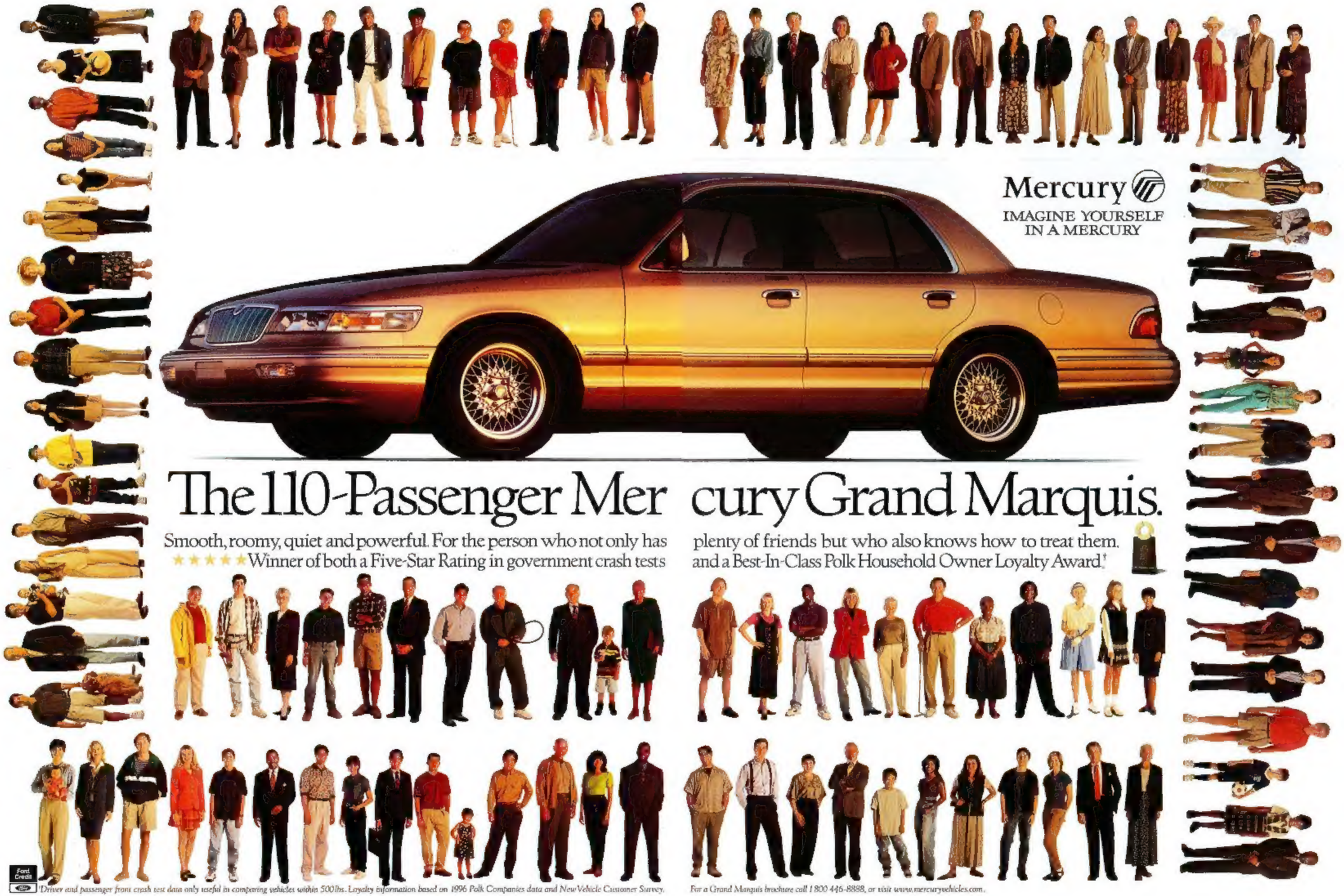

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Why I Hate Paneling

The true calling of our generation is to rip out all our parents' plastic and replace it with real stuff

BY JEANNE MARIE LASKAS

My friend Ellen just got a new kitchen floor. She is very proud of this floor She invites me over to walk on it "Very nice," I say, clip-clopping over the oak planks. They're in a box pattern with a cherry border. I have to admit it's a beautiful floor. "It's not real," she says.

It's not? "Nope," she says. "Can you believe it?"

No, I can't. I get on my hands and knees and do what humans instinctively do when faced with alternative wood products: I go tap, tap, tap with my knuckles, expecting to hear the hollow plink of a child's toy.

"Wow," I say, noting that this floor goes clunk, clunk, clunk, passing even the knuckle test.

Ellen smiles the knowing smile of a vinyl-floor salesperson. I shake the bemused head of a confused customer. I mean, I can't believe this is happening to me. I am actually attracted to this man-made wood floor. I am actually beginning to imagine how it would look in my entrance hall. Perhaps I need a r

Ellen hands me a brochure explaining that, technically, this floor is made of a sawdust and glue mixture, covered by a photograph of wood, coated in plastic. The brochure tells about the "spectrographic process" that accounts for the floor's "unsurpassed realism." I consider this. I get all twisted up in the norms of a sawdust-and-glue philosophical

ILLUSTRATION BY TOM GARRETT

dilemma. I mean, surely there is one thing that surpasses even the unsurpassed realism of this man-made wood. e.g., wood. But if I believe it's wood, does that make it real to me?

"What is reality anyway?" I ask Ellen. "Isn't it, after all, contingent on our beliefs?"

She looks at me. "It's just a floor," she says.

Perhaps. But I don't take the issue of being fooled by an alternative wood floor lightly. I am a person who has had a lot of looks-like-wood experience, none of it good.

It all started when I bought my first house, a somewhat dilapidated Victorian that had been "renovated" in the 1970s. That meant the place had been covered in bad paneling, thin stuff that is supposed to look like wood but looks more like, well, thin stuff. Much of the paneling was brown, but some of it was green and some of it was powder blue.

I tried not to get angry at the paneling. I mean, it wasn't the paneling's fault that it was an awful, horrible, monster of a bad home-remodeling decision. "Work with it," I told myself.

Maybe this is an attempt to legitimize our lives, to connect with our ancestors by using the same building materials they did.

I painted it white, hoping to achieve the effect of a white wall that just happened to have a lot of vertical lines and bumps and waves in it. Bad idea. So I covered it with some of that superthick wallpaper, followed by a more decorative wallpaper. *Really* bad idea, unless you like walls that look like those papier-mâché creations you made in grade school.

Eventually, I went at the paneling with a crowbar. "Die, fake wood! Die!" I said, gritting my teeth, until I reached the mangled plaster beneath. It took years before I finally rid the entire house of paneling and basked in the joy of real plaster walls.

Then I bought a turn-of-the-century farmhouse that had been renovated in, yes, the 1970s. Bad paneling in the living room. Bad paneling in the dining room. Bad paneling everywhere.

I am haunted by this stuff. I am beginning to wonder why it exists. Why, for that matter, do those fake wood countertops made to look like butcher block exist? Why does vinyl siding with lines in it to look like painted wood exist? And why, for heaven's sake, do the dashboards of extremely fancy cars nowadays feature real wood covered in so many layers of plastic it fails even the most cursory knuckle test? Tap, tap, tap, you find yourself going, trying not to be conspicuous about this in front of your rich friend who is showing off his new Lexus. You're thinking, Is this real wood? Of course, you can't say that to him.

Fake wood, to the people of my generation, is not a good thing. It's a '70s thing. It's pea green shag rugs and drop ceilings and fluorescent tube lights and curly linoleum that once pretended to be marble.

It's the way our parents did home remodeling, back when do-it-yourself was an industry in its infancy. Maybe all our parents had to choose from was inferior building materials. Maybe they were brainwashed by clever salesmen, I don't know. But it has become the task of my generation to rip out what our parents did and redo it with "real" stuff. Real wood. Real plaster. Real ceramic tile.

Maybe this is an attempt to legitimize our lives, to connect with our ancestors by using the same building materials they did. Then again, it could just be that my generation has better taste than our parents had.

Which reminds me. I once met a salesman who specialized in the material used to make fake wood coffins. "Plastic coffins?" I said. He told me he also made plastic doors, plastic windows and plastic rocks with stereo speakers inside for putting around swimming pools. He told me that the entire Disney World Grand Floridian Beach Resort was encircled in his company's plastic railings.

"But ...coffins?" I said. Wasn't that taking the old dictum that the future is in plastics a little too far? Who would want to be preserved forever in Tupperware?

"Hey, it's an alternative," the salesman said. "It's fire retardant. It has dimensional stability. And I guess when you're dead, you know, you're not going to worry about what you're in too much. I don't want to get too morbid here. . ."

Me neither. I'll leave the question of the afterlife to the plastics salesmen and conclude by stating what I believe to be the mantra of our home-remodeling age: You can't take pride in something that's not real. Until now. My friend Ellen is not the alternative wood type any more than I am. And now look at her. Handing out brochures. And look at me. Taking a brochure and dialing the 800 number to get my new entrance hall.

Is this a testament to technology? Has the problem with alternative wood products all along been that they simply haven't looked real enough? Or has the problem been a more personal one—that we know, deep down, that the stuff isn't real wood, and we can't get past our own prejudice?

"Is it the substance?" I ask Ellen, "or is it the essence?"

She gives me that look again. "It's just a floor," she says. She opens the refrigerator, reaches for the orange juice. Two eggs fall out and break on the floor. It couldn't care less.

...you've ever cooked on an ordinary gas grill. The odds are you've apologized for it. The flare-ups that singed your expensive steaks. The cold grill corners that made it impossible to cook food evenly. The shoddy construction.

We apologize no more.

Introducing the Weber® Platinum Series II™. Remarkable? Not really. Not when you consider that it comes from a family of overachievers. Like its predecessor, the legendary Genesis® Gas Grill, the Platinum Series™ solves ordinary grilling problems in an extraordinary fashion.

For starters, we've eliminated flare-ups. (That's when fats collect, reach a flash point and burn out of control.) Instead of using lava rock or flat metal plates, we created a patented cooking system made of stainless steel Flavorizer® Bars. When juices hit, they sizzle, smoke and add a delectable outdoor flavor.

weber
"The Legend Lives On."

Our Crossover® Ignition system assures a fast start. Three strategically placed burners provide another rarity: even heat. Every time. But that's not all. We take the finest grade steel and protect it with a shield of porcelain enamel. Fired at 1600° F, it'll never rust, fade or peel.

Which leads to construction. An incredibly strong robot-welded cart features extra-large porcelain-enameled steel work surfaces. Then we virtually assemble the grill in-house, so you can set it up at home in minutes.

Finally, we considered the most important detail. Your complete satisfaction. That's why we offer an unprecedented 45-day, money-back guarantee.

Excessive? Perhaps. Unless you want a grill engineered by people as passionate about its construction as you are about using it.

To learn more about the Weber Platinum Series II, call 1-800-99-WEBER (1-800-999-3237) in the U.S. or Canada. Or visit our home page on the World Wide Web at www.weberbbq.com.

Look what happens when you play with fire for a living.

extras

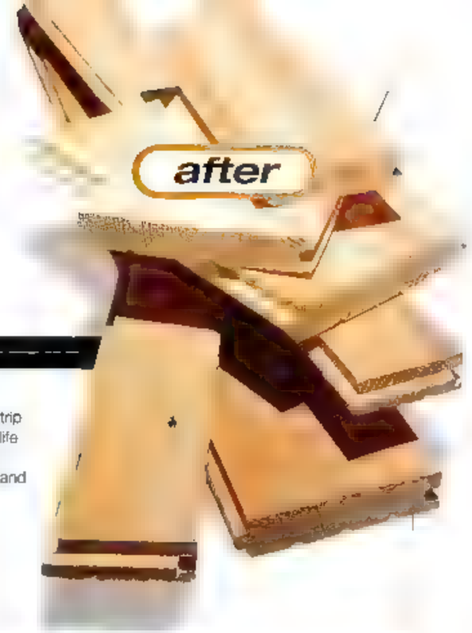
photographs by Darrin Haddad

from warehouse to your house

The ubiquitous shipping pallet eats up some 4.5 billion board feet of hardwood and 2 billion of softwood cut down in the United States every year. Pallets may travel the world in their short, hard life, but after one or two uses, most are sent to a landfill. That's changing, however, as more than 1,000 companies now recycle pallets into mulch, livestock bedding or particleboard. David Muchnick, chairman of Big City Forest, a New York manufacturer, has grander designs: transforming discarded pallets into butcher-block tables, benches, bookcases and planters. From 180,000 pallets a year, the group harvests cherry, fir, maple, pine, oak and even mahogany, using the poorest scraps to construct new pallets and remilling the quality boards to make furniture and one of its most promising products, wood flooring. The floors' rustic charm impressed thousands of people who walked on them last year in two model homes built by the National Association of Home Builders in Maryland. Muchnick hopes that's just the beginning. The oak in one third of all pallets is "perfectly serviceable" and if recycled could eliminate the need to cut new trees for floors—while propelling the lowly pallet to new heights of warehouse chic

KELLER & KELLER

"Pallets are rapidly becoming the most recycled thing in America," says John Healy, executive vice president of the National Wooden Pallet and Container Association. **LEFT:** Bob Lavoie of Mason, New Hampshire, spent eight months and reused 30 pallets and crates to build a 45-by-46-foot storage shed for his stove and fireplace business. "I've had a ball building it," he says, "and I feel like a king. I'm getting something for nothing."



RIGHT: Big City Forest mills reclaimed pallets into tongue-and-groove strip flooring in oak, maple and cherry. **OPPOSITE PAGE:** The wood's former life is evident in the bookcases, butcher-block tables and modular planter benches made by woodworkers at the Bronx, New York, facility. Nicks and nail holes are filled and finished but still visible.

sacred stone

When the Tohono O'odham Nation decided to build an elders' center, tribe members made a pilgrimage to Schuk Toak—Black Mountain—their extinct volcano near Tucson that once provided refuge from marauders and still serves as a ceremonial site. After offering the mountain tobacco and a prayer, tribesmen combed the sacred slopes for brown, gray, black and red basalt stones to create (with profits from the nation's new gambling operation) a kind of indoor-outdoor communal living room with a strong connection to their past. "The mountain is like a grandfather. It's always watching and seeing. The elders too have seen, and suffered, as their land has changed. We wanted the mountain to protect them," says tribal official Daniel Preston. Now elders share stories and meals inside the 16-inch-thick stone walls, sheltered as their ancestors were by their native rock.

ALLEN MAERTZ

hanging in there

Masonry anchors do one thing very well: fasten anything to concrete, stone, brick and block. These tenacious devices use adhesives, expanding sleeves and shields, hardened steel threads and pure friction to grip with up to 13 tons of holding power. All require an insert hole, best made with a hammer-drill and a carbide-tip bit. 1. An epoxy anchor consists of nested mesh and threaded inserts glued into the hole. 2. This light-duty plastic bolt toggle swings up and acts like a barb when pushed into the hole. 3. The nail anchor redefines the old masonry nail with curving flutes that score and grip concrete as it's hammered in. 4. This bent shaft anchor, made of hard grade-8.2 steel, slightly straightens, and grips tight, when driven in. 5. A nylon sleeve anchor expands and gets wedged inside the hole when a nail is driven through it. 6. A serrated sleeve drills its own hole, then expands at the tip as it's hammered onto a flared plug. 7. A stud anchor bolt flares at the bottom and as the nut on top is tightened. 8. The masonry screw has hardened steel threads that bite directly into the concrete. 9. The shallow-embedment anchor sinks as little as 5 millimeters into stone, tile or concrete, but the special flared hole must be bored with a $6,000 tool. 10. & 11. Expanding sleeves spread open as their bolts draw in wedges. 12. This lag shield spreads open and compresses against the side of the hole. 13. Light-duty fibrous anchors of braided jute and lead expand when taking in a screw.

House Bound

Open a door (or a window) to reveal blank pages—the perfect place for shop notes, to-do lists or that ever-growing roster of items you keep meaning to talk to your contractor about.

BUYER BEWARE! A/C OVERKILL

Buying a central air conditioner can be an exercise in chilly excess, concludes John Proctor, an American Society of Heating Refrigerating and Air Conditioning Engineers member. After studying 22 Phoenix-area homes, he found that all had oversize cooling systems—some with twice the needed capacity. Oversize units not only cost more to buy and operate but are also less effective as dehumidifiers. Proctor says homeowners should insist that air-conditioning contractors figure the load and unit size using the work sheets in manuals J and S of the Air Conditioning Contractors of America and the Air-Conditioning and Refrigeration Institute. And don't get talked into padding the figure—if the math is done properly, you should be sufficiently cool.

"The **four most expensive words** in the English language? **'While you're at it.'"**

Architect Hugh Newell Jacobsen

things that go **clump** in the night

A cat-owner laments: "Our problem started with a coupon, from a well-intentioned friend, for 'clumping' kitty litter, the stuff that forms a kind of cannonball when wet. Intrigued, my daughter volunteered to clean the cat box, disposing of the evidence with a merry whoosh down the commode (a time-honored method with primitive litters). A few days into our experiment, I made a nighttime visit to the bathroom. I flushed. A tsunami erupted, flooding the bathroom. The next morning, plumbers arrived, uprooted the toilet and chiseled out those wee clumps—which had hardened into something like concrete. After they left, I belatedly looked at the label: The manufacturer 'does not recommend the flushing of any litter.' You're telling me."

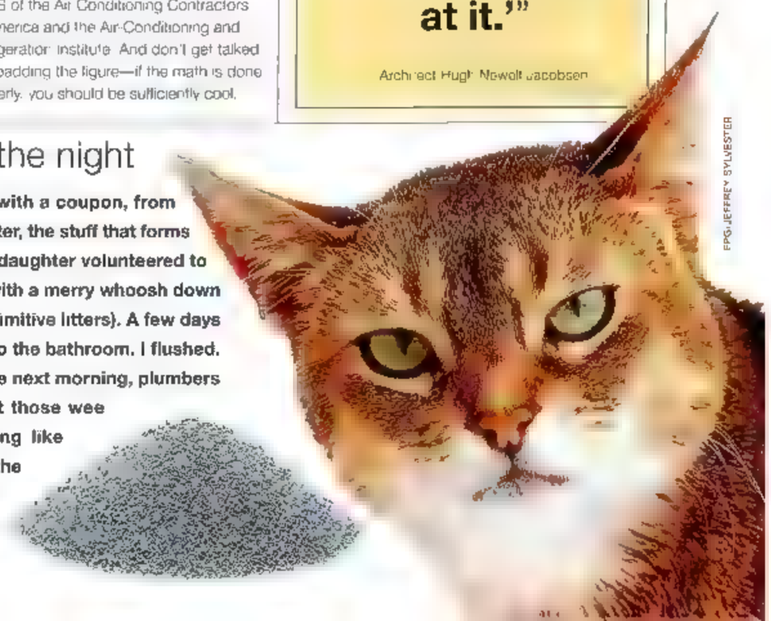
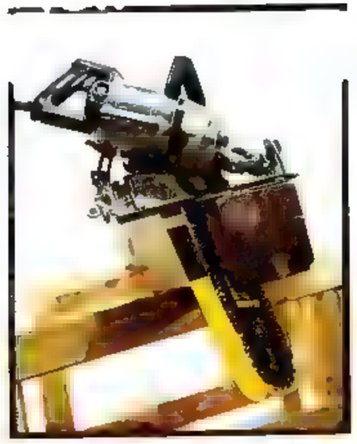


PHOTO: JEFFREY SYLVESTER



The org arm of the **saw**

Cross a chain saw with a circular saw and you get a tool that cuts deep and stays on line. Mount the Prazi Beam Cutter—basically a 12-inch chain-saw blade—on a circular-saw driveshaft, and it's ready to make straight cuts to 12 inches and 45-degree bevels to 8 inches. We mitered a 6x6 landscaping timber in one pass and liked the speed and accuracy of the cut. Framing a roof? Stack up to five rafters and cut all the ends and bird's-mouths at once with four passes instead of 20. You'll need both hands on the saw, so clamp down whatever this brute feeds on.

Events and Appearances

Norm Abram
Aug. 10, 11 &12
National Hardware Show
McCormick Place Center
Chicago 203-840-5622

Richard Trethewey
Aug. 10 & 11
National Hardware Show
Chicago

Steve Thomas
July 25 Seattle Garden Tour
Aug. 10 National Hardware Show, Chicago

Those hefty 12- to 24-inch tiles that have become so popular have posed an installation problem. They're more likely than smaller tiles to crack or come loose. No one knew why—until Joe Tarver of the National Tile Contractors Association did some experiments. Working with clear glass squares, he found that tiles set on mortar-based adhesive spread in a figure-eight pattern with a notched trowel can trap air underneath, hindering contact. Instead, Tarver says, comb the mortar in a straight line, set the tile in place and nudge it back and forth across the rows about a quarter of an inch. That little move produces a remarkably even distribution of mortar and a solid installation.

PORCH PAINT, PART 2

In last issue's Extras, we told why porches in Pennsylvania traditionally have sky-blue ceilings: to repel flies. But in Charleston, South Carolina, local lore has it that superstitious West Indian slaves feared nighttime visits from evil spirits they called haints, so they painted porch ceilings to mimic the daytime sky. You can still order the paint by its old name, haint blue. Have another blue-porch theory? Send it to: Extras, *This Old House*, 55 E. 52nd Street, NY, NY 10022.

Over and over the slur the
scrape and mix / As he
trowelled and retrowelled and
laid down / Courses of glum
mortar. Then the bricks /
Jiggled and settled, tocked
and tapped in line / Moved
especially the trowel's shine, /
Its edge and apex always
coming clean / And brighten-
ing itself by mucking in / It
looked light but felt heavy as
a weapon. / Yet when he lifted
it there was no strain / It was
all point and skim and float
and glisten / Until he washed
and lapped it tight in sacking
Like a cut blade that had to
be kept hidden.

From "Damson," in Nobel Prize-winner Seamus Heaney's new collection, *The Spirit Level* (Farrar Straus Giroux).

LIFE IS FULL OF HURDLES.

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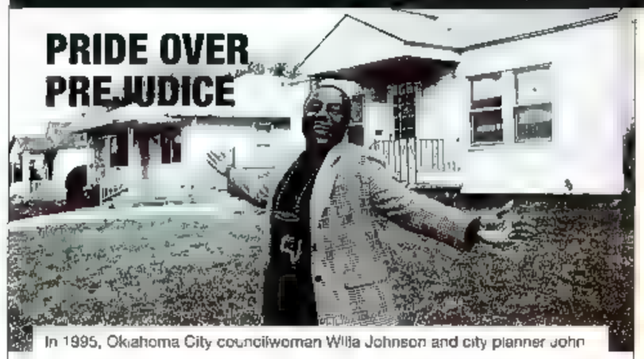


In 1995, Oklahoma City councilwoman Willa Johnson and city planner John Calhoun began documenting 119 small, boxy houses in a neighborhood they believed deserved special recognition. In the 1930s, when blacks were relegated to "poorly built houses and tired hand-me-downs," Calhoun says, developers Walter and Frances Edwards made an end run around housing discrimination: Before buying the 33-acre tract, they had the white owner get it approved for development. By 1939, despite warnings from a Federal Housing Authority director that "Negroes will never work hard enough ... to pay off the loans," the couple had secured federal financing for the future homeowners, making the Edwards Addition the first FHA-funded project for African Americans. Last October, the National Register of Historic Places put the Edwards Historic District on its list. Now Johnson sees more houses in disrepair getting renovated, and, she says, "folks aren't shy about talking to neighbors" about fixing up their places. In March, the city thanked the rookie councilwoman in the nicest way possible, with reelection.

"We looked forward to introducing our newborn child, Luke, to **Bugs** and **Bullwinkle** and **Bert** and **Ernie,** and even **Steve** and **Norm** on *This Old House.*"

Adam Cohen, in the Apr. 19, *New Yorker*.

to drain, perchance to weep

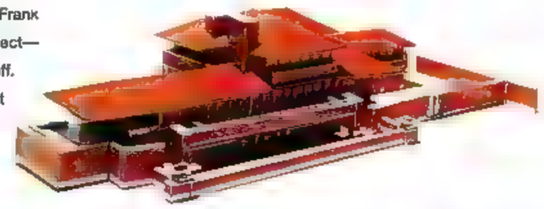
Does every downpour turn your basement into downtown Grand Forks? Before calling the National Guard, whip through *The Original Basement Waterproofing Handbook*. Author Jack Masters helps America dry out by explaining "everything you need to know about what caused the mess in your basement and what to do about it"—such as the best way to drain window wells, shown at left. Like his self-published tome, Masters is direct and optimistic: wet ankles and all. "The best solution," he says, "is often the least expensive one."

Working the Web
CONSTRUCTION SITES

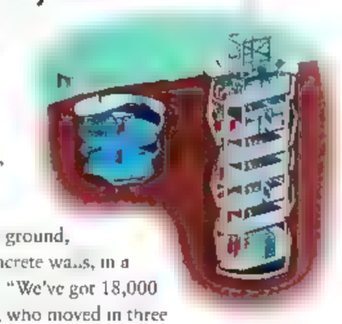
Like to watch? Would-be builders can get a voyeur's view of people's construction projects. When the Sissons, a self-proclaimed "techie family," decided to build their dream, it was only natural to document its progress on-line (**www.erols.com/sissons**) with floor plans, photographs and a visitors' "Guest Book." The project at **www.twomoons.com/eclectic/adobe.htm** hasn't yet broken ground, but owner Larry Alan Smith vows to "build an adobe home on my land if it's the last thing I do." He's put up a detailed set of plans and many links to other sites devoted to adobe, rammed earth and other construction alternatives. Go to **www.morsepr.com/MMdocs/Bill.html** for what may be the ultimate in cyber-construction: Bill Gates's mansion-in-the-making has been swathed in secrecy, but some intrepid folks at a Seattle public relations firm have been sailing out on Lake Washington to snap shots of the $50 million, 40,000-square-foot behemoth.

House of Cardboard

Edmund V. Gillon Jr.'s paper Robie House is a full-color, scale model of Frank Lloyd Wright's prairie-style original. It's a perfect rainy-weekend project—if cutting, folding and pasting 132 pieces of paper doesn't turn you off. Our advice: Go slowly, be careful with that X-acto knife—and don't give up. Once you get the knack, you can slice your way through a collection of 25 models of historically significant houses.



18,000 Sq. Ft., No Vu



Ed Peden lives in Kansas, a state famous for its tornadoes. "But we don't worry about them," he says. "When those warnings come on, we just laugh." No wonder: Peden and his family live 23 feet below ground, behind 18-inch-thick concrete walls, in a former Atlas missile site. "We've got 18,000 square feet," says Peden, who moved in three years ago. Since then, he's made missile sites his business, selling decommissioned Atlas, Titan and Nike complexes, some on as many as 60 acres, for conversion into private homes. Peden's is typical of the 1960s-era Atlas E bases: a sunken command building, connected by a 120-foot tunnel to a launch service structure where the missiles were stored. So far, he and his partners have sold a dozen bases around the country ranging in price from $40,000 to $300,000. If potential owners aren't put off by the lack of a view and the challenge of decorating all that space, Peden says, they'll get to take advantage of cheap heating and cooling—and the security that comes with a 47-ton door.

a better banger

OKLAHOMA CITY PHOTOGRAPH BY MICHAEL MANUEL. DOORBELL BY TAMARA REYNOLDS. ILLUSTRATIONS BY STEVEN STANKIEWICZ

Our May/June '95 review of carpenter Ted Lloyd's triangle-face hammer found that while it allowed driving nails close to corners, the flat face left nasty scars on wood. Now Lloyd has an improved design. It's round, with a flat top for corner work, and slightly convex for better control. It's also safer. Swatting your skin with the old waffle-face produced the dread Swiss Steak Effect, but this hammer's golf-ball dimples grip nailheads fine and don't eat flesh.

opportunity rings

After tinkering for three hours with the wheezing doorbell in his 1906 Edwardian house, Kevin Evans heard a sound for which he eventually abandoned his career as a recording engineer: the melodic ring of London's Big Ben. It was like hearing "the heartbeat of the house," he says. Now his Oxford Chime Works in Rogersville, Tennessee, refurbishes vintage door bells and builds new ones that look old, among them Arts-and-Crafts-inspired wooden cabinets housing cast brass bells. Evans's creations feature multiple melodies and can be customized through digital technology. Although the Big Ben and "ding-dong" chimes are still the most popular, some homeowners prefer a zippier greeting: One customer wanted guests to hear the theme from his favorite cartoon—the "Jetsons."

For details and sources see **Directory** *on page 133*

TO THOSE OTHER PALM GRIPS
CLAIMING TO HAVE A LOT OF POWER,
WE HAVE A REPLY: EAT DUST.

Dual-range Swift-Sand™ system lets you shift between fine finishing and high speed stock removal at a button's touch.

Harness the fury of the most powerful random orbit palm grip in the industry.

Integral dampening system regulates pad speed and helps prevent accidental workpiece damage.

This one tool lets you sand dowels flush quickly and finish cross grain and large panels flawlessly.

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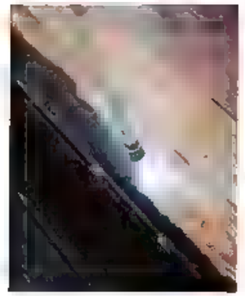
Grime Busters

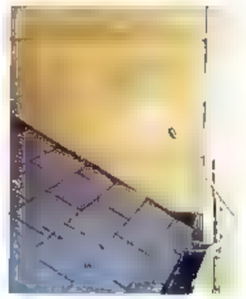
Pressure washers turn tap water into a blast

BY MARK FEIRER



On algae-covered decks, Darlington uses high-pressure water laced with bleach. He sweeps with the grain near the surface. Stubborn stains are lifted with a dose of detergent, then rinsed.

Washing stone is simple. "Get in close and blast away. You can't really hurt the stuff"—but go easy on mortar joints.



A 25-degree green tip wipes algae off shingles. Spraying a house demands utmost care, because of the washer's power to inject water behind siding.

PHOTOGRAPHS BY KEITH SMITH

Like a good squirt-gun fight, pressure washing a house is sloppy business. Bill Darlington dons old clothes and rubber boots with knurled treads before he starts, because the water and the gunk it dislodges bounce right back at him. Bleach and detergent greatly augment a washer's cleaning power. His machine sucks the solutions from the buckets directly into the spray hose.

Amazing stuff, water. Spraying softly from a sprinkler at 40 pounds per square inch, it's a benign plaything for squealing children. But fed through a pressure washer's pinhole nozzle at 4,000 psi, the incompressible liquid becomes as unyielding as Swedish steel, hard enough to carve divots in wood, blast mortar from brickwork or even slice off a hand.

Throttled back and aimed with care, though, a pressure washer makes quick work of dirty jobs. Painters use them to blow loose paint, dirt and chalk off walls when they prep a house for painting. *This Old House* landscaper Roger Cook uses his washer to clean walks at job's end. Ever wonder how new cars look so clean on the lot? Dealers spray them with a non-spotting,

TOOL TALES

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№ 7

THE HOOK SNAGGED 175 POUNDS of TWISTING, WRITHING LAWYER

Imagine his floppy arrogance attached to him by a measly mile. Luckily my LEATHERMAN tool flashed in my hand, and I cleanly cut the hook. Todd's no worse for wear. As for the Salmon, let's just say, he's caught his last fisher man.

Chad Woodman
Syracuse
New York

PST II

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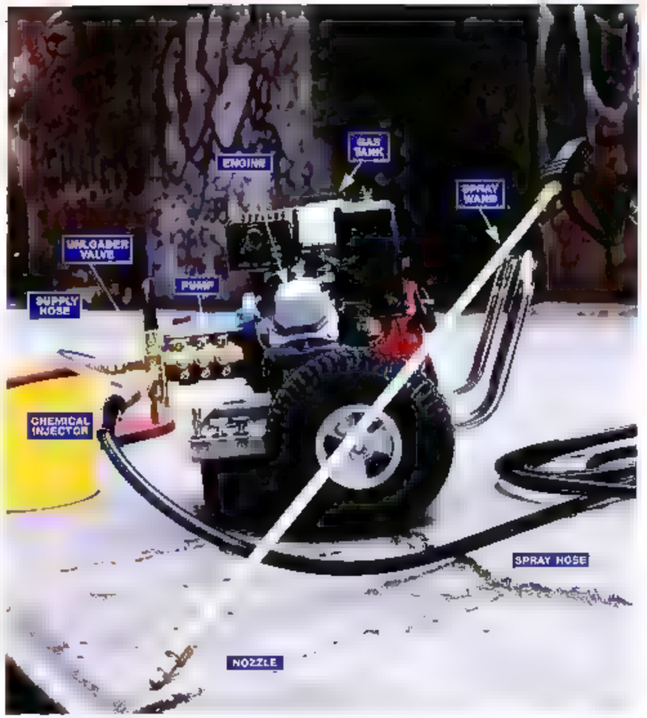
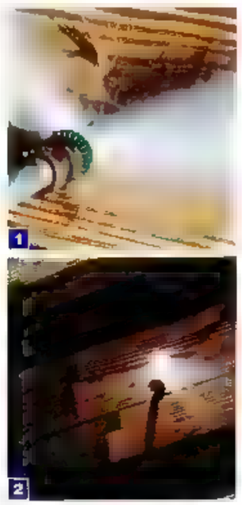
Big squirt

Hooked up to a bucket of detergent, this 80 pound mite is ready to do battle against neighborhood graffiti. Its 5½ horsepower engine pumps up to 3 gallons per minute at 2,000 psi. Four cycle gas engines like this call for the same care as a lawn mower. Change dirty oil and filters, pop in a new spark plug yearly and add fuel stabilizer if gas sits in the tank.

A pulsing or dying spray may signal a broken hose or clogged water filter. If hose and filter are okay, check the unloader valve. It senses pressure backup when the wand is shut and recirculates water through the pump so a hose won't burst.

After using chemicals, rinse everything downstream from the pump in fresh water. Spray tips must match a washer's pressure, replace them as their holes wear away and enlarge.





1. A washer with a high-pressure tip does more than raise grain; it will blow craters in wood. 2. Stopping a wand abruptly as it passes over the surface leaves indelible marks on a deck.

TOP PHOTOGRAPH BY DARRIN HADDAD BOTTOM PHOTOGRAPHS BY KOLIN SMITH

deionized water from a pressure washer.

Yet cleaning houses is how pressure washers earn their keep. That's what pro Bill Darlington does most days on homes throughout the Philadelphia suburbs. His big van mounted rig, with its hose sprouting water pump and eight horsepower gasoline engine mounted on a two-wheel cart, looks like a toothless rototiller on life support. The washer is kept running spring, summer and fall, blasting moss off patios, soot off stone and algae off decks. Some of Darlington's grimephobic clients have him wash their houses every other year—at $300 to $400 per wash.

Scampering up an extension ladder at a recent job, Darlington swipes his hand across the side of a seemingly white gutter to show how filthy it really is. Like flypaper, it has collected all sorts of airborne junk. "Diesel smoke," he says, "that's the worst." It takes more than water pressure to rid a house of this oily soot, so Darlington takes a clear plastic tube branching off a T-valve on the spray hose and sticks it into a bucket of detergent. This siphon tube, part of the downstream chemical injector, sucks solution out of the bucket and into the hose whenever he pulls the trigger on the spray wand.

A pressure washer's ability to deliver chemicals has made it a favored weapon in the fight against mildew, the black mold that stains houses and drives painters wild. "If you paint over mildew," warns Darlington, "it'll grow right through the paint film and you'll never get rid of it." Sodium hypochlorite, the active ingredient in bleach, kills mildew and its spores on contact, but because the injector dilutes the bleach by about one eighth, Darlington uses triple-strength chlorine from a pool supply outfit.

Starting at the bottom of a wall, Darlington methodically sprays a bleach and water solution at low pressure back and forth with overlapping passes until he reaches the top. Like a spray painter, he moves the nozzle

It helped to have a few control frea ks on staff.

Who better to design and engineer a great handling sedan than people who are obsessed with power and control?

It was just such people who insisted Dodge Stratus ES have standard anti-lock brakes as well as a fully independent, modified double-wishbone suspension like you'd find in race cars.

They lobbied for an available speed-sensitive, variable-assist, rack-and-pinion steering system that allows for easy maneuvering in parking situations, yet provides plenty of road input at speed. They wanted the option of an AutoStick® transmission that gives you the responsiveness of a manual. And in their ultimate power play, they saw to it that Stratus ES has an available 24-valve, single overhead cam V-6.

But by meeting their demands, it seems we met yours, too. Because in J.D. Power and Associates latest APEAL Study™, Stratus tied as the "Most Appealing Entry Mid-Size Car." For still more information, call 1-800-4-A-DODGE or visit our Web site at http://www.4adodge.com*

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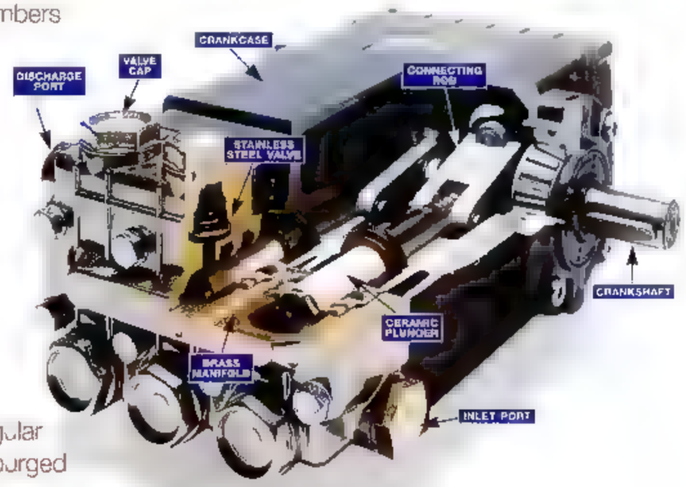
**1998 Automotive Performance, Execution, and Layout Study, based on 25,492 consumer responses. Always wear your seat belt.*

The telltale heart

A pressure washer's pump has two chambers. Water flows through the stainless, one-way valves at the wet end, parts that require oil lubrication such as the crankshaft, are sealed at the other end. Ceramic pistons, called plungers in the trade, cycle between the two. This aluminum-bodied, three-plunger triplex pump can move 4.5 gallons a minute at up to 2,000 psi. Cleaning power depends on the pump engine. Low horsepower motors generate meager water flow at higher pressures. Healthy pumps need clean, filtered water and regular oil changes. The manifold must also be purged after use to prevent freezing or corrosion.



parallel to the wood at a uniform speed and gives it a feathering upturn at the end of each stroke. Switching to soap, he repeats the process to loosen dirt, chalk and bleach, then makes a third pass with clear water at high pressure, working from the top down. To prevent bleach and detergent from drying, he rinses each wall thoroughly before moving to the next. Painters and power-washing pros agree that there's no such thing as rinsing a bleached house too much. If residue remains, it will weaken the new paint's bond and corrode metal.

Electric pressure washers are easier to care for, more portable (despite the need for an extension cord) and quieter than gas-engine washers. They top out at around 1,800 psi, fine for occasional use around the home. Be sure they're plugged into a ground-fault circuit interrupter (GFCI).

Any time wood shingles and clapboard are sprayed, a cautious, test-and-see approach is best. Too much pressure can plow furrows in wood, and spraying upward at too low an angle will inject water and chemicals behind the siding. Done right, the house will be dry enough to paint in a couple of days. Done wrong, it may take weeks to recover.

There are three ways to control a washer's power. One is with engine speed. Darlington's machine can move four gallons per minute at 4,000 psi, but most days he throttles back to 2,800 psi. Even at that pressure, the hose turns rock-hard, and the wand has a noticeable kick when it sprays. (Darlington says it's a great workout.)

Spray tips provide a finer measure of control. Darlington carries an assortment in his pocket and swaps them for different surfaces and gunk. There are four basic tips, classified by their spray width: 40-, 25-, 15- and 0-degree. The 40 tip produces a soft, flat fan, a 0 tip focuses water into a narrow,

Advice from a pro

- **Buckets of bleach and detergent can permanently stain driveways and kill grass; park the containers on dirt.**
- **Pressure washing won't remove rust marks.**
- **When bleach or soap dries on glass, it won't rinse off. Wipe down windows with a towel.**
- **Keep kids and dogs away from puddles so they don't track bleach over carpets.**
- **Protect foundation plants from bleach with plastic tarps and flood the soil after cleaning. Shrubs should be uncovered immediately; they will cook in minutes if left covered in the sun.**
- **Avoid windows. Even if you don't break the glass, water will shoot indoors through cracks.**
- **Never aim at power lines or outlets. Electricity can flow along a solid stream of water.**
- **Guard against accidental injections through the skin with thick rubber gloves.**

PHOTOGRAPHS BY DARRIN HADDAD

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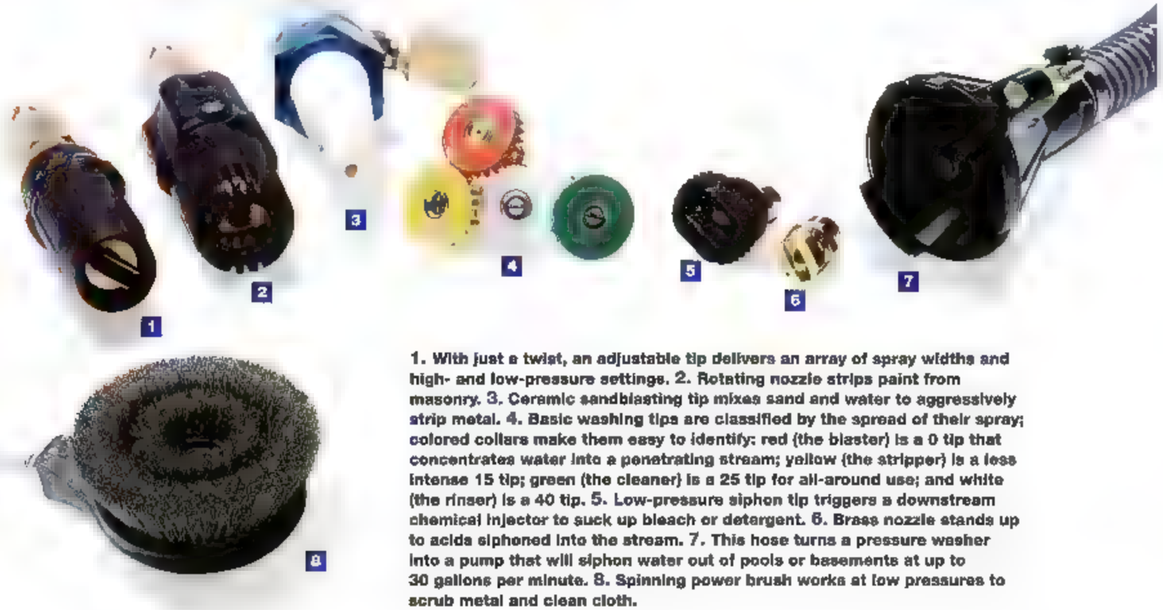
Tip terminology

Equipped w th the r ght tip, a pressure washer can sandb ast rusty metal, s urp water from a poo even scrub awnings



1. With just a twist, an adjustable tip delivers an array of spray widths and high- and low-pressure settings. 2. Rotating nozzle strips paint from masonry. 3. Ceramic sandblasting tip mixes sand and water to aggressively strip metal. 4. Basic washing tips are classified by the spread of their spray; colored collars make them easy to identify: red (the blaster) is a 0 tip that concentrates water into a penetrating stream; yellow (the stripper) is a less intense 15 tip; green (the cleaner) is a 25 tip for all-around use; and white (the rinser) is a 40 tip. 5. Low-pressure siphon tip triggers a downstream chemical injector to suck up bleach or detergent. 6. Brass nozzle stands up to acids siphoned into the stream. 7. This hose turns a pressure washer into a pump that will siphon water out of pools or basements at up to 30 gallons per minute. 8. Spinning power brush works at low pressures to scrub metal and clean cloth.

piercing stream that can obliterate stains from stone or reach up to inaccessible gables. Darlington's workhorses are the low-pressure 15 and high-pressure 25 tips.

The third control is distance. Water's velocity (and therefore its power) drops rapidly after exiting a nozzle. Darlington is careful to hold the nozzle a uniform distance from whatever surface he's working on "so that no part of the house is cleaner than another."

When buying or renting a washer, pressure is a key feature to consider, but it isn't the only one. Pressure and water flow have to be kept in balance or cleaning power suffers. A. Stasny, supervisor of lab services for General Pump, suggests one way of comparing machines is to look at impact force (.0526 x gpm x the square root of psi)—the higher the impact force, the greater the cleaning power. Using that formula, a washer pumping 4.5 gallons per minute at 2,000 psi has an impact force of 10.6 pounds, which will clean faster than one pumping 3.5 gpm at 3,000 psi (an impact force of 10.1 pounds). According to Dick Darlington, Bill's older brother and the other half of Darlington Restoration, a good machine for homeowners would deliver between 3 and 4 gpm at 1,500 to 2,000 psi. All else being equal, he recommends going with the best engine, one with durable cast-iron cylinder sleeves or a reputation for easy starting. He wouldn't use a machine that circulates chemicals through the pump; bleach and detergent shorten piston and valve life. Washers with downstream injectors are a better choice.

The pressure washers that meet Dick Darlington's criteria cost about $500 and have gas engines. Higher pressures and bigger flows require bigger engines, which quickly push the price past $1,000 and increase the tool's havoc-wreaking potential. Whatever size washer you choose, he says, take time to learn its nuances. Rush into power washing, and the way to a clean house will be littered with destruction.

Safe spraying

After a day on the job, a wet, worn-out Darlington is dirty enough to need pressure washing himself. He's smart enough to know better—even his least powerful tips could force bleach-laden water through his skin and into his bloodstream, and the sharp stream from his red 0 tip could perform a clumsy amputation. Darlington figures the safest ladder is the one he's not on. Six-foot wand extensions let him avoid soapy rungs by spraying from the ground; he'll fit on one or two to reach into gable ends and other awkward spots. It's an approach that requires vigilance: The wobbly wand can smack windows and clobber light fixtures.

PHOTOGRAPHS BY DARRIN HADDAD

For details and sources see **Directory** on page 133

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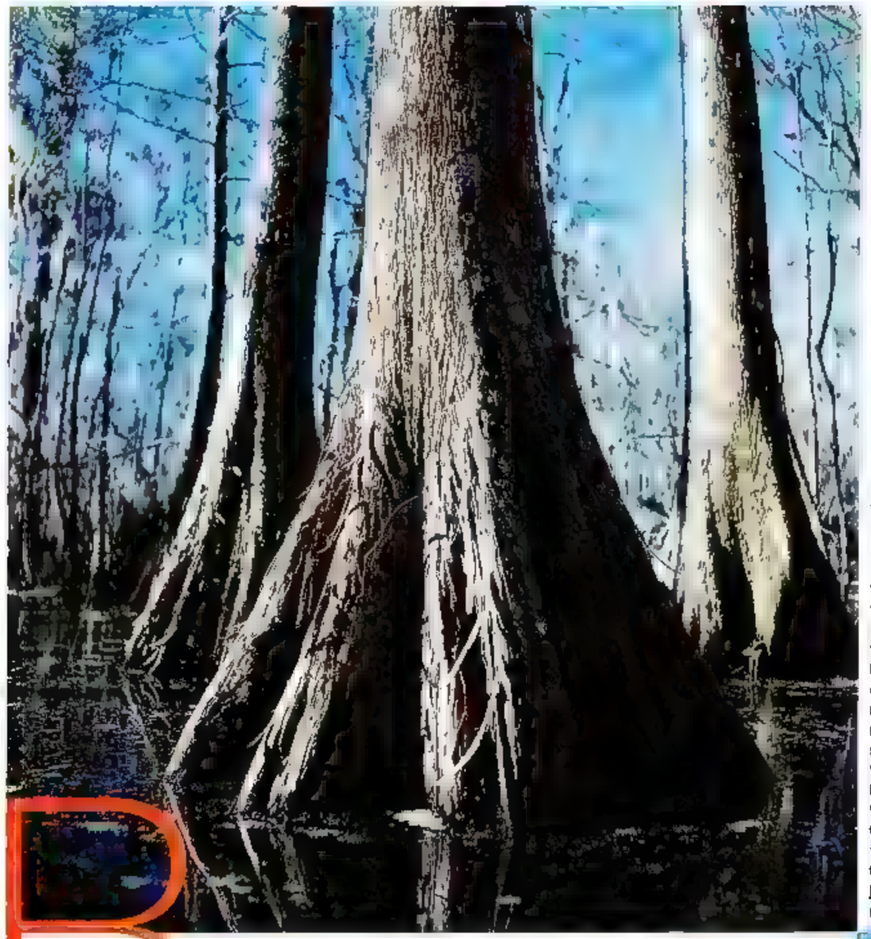
Swamp Wood

Cypress stands up to water

BY BRAD LEMLEY



LEFT: Majestic, buttress-trunked bald cypress trees, survivors of the early 20th century's intensive logging, thrive in the black-water swamps of Louisiana's Barataria Preserve. In a few centuries, the slow-growing trees will pack so much wood around their trunks the buttresses will disappear.
BELOW: Bruce Killen marvels at the stamina of a cypress fence on Nantucket's North Star Lane. "We got a photo of the house dated 1897. The fence is there, and it looks just like it does now," he says.

TOP PHOTOGRAPH BY RICK OLIVER. BOTTOM BY KEN KOCHEL

Rising from bayou muck, the old ones towered 150 feet, stretched 15 feet in diameter and lived more than a thousand years. From Delaware to East Texas, they were inspiration for artists, dappled shade for swamp rats, graceful, gray green canopies under which entire ecosystems thrived.

Though the first growth giants were long ago cut down, sliced, dried, planed and nailed, the wood is still a wonder: a rare admixture of durability, workability and subtle beauty, venerated by carpenters for centuries. According to some versions of the Book of Genesis, when God called out specifications for Noah's ark, he demanded that the hull be crafted of cypress. Noah would have used a true cypress *(Cupressus sempervirens)*, which still lives in southern Europe. American lumberyards mostly stock bald cypress *(Taxodium distichum)*, actually a relative of the redwood that shares the formida-

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ABOVE: In Killen's Death & Resurrection millwork shop, Gerald Lendway builds an exterior door out of cypress, the wood of choice to withstand Nantucket's blowing rains. LEFT: Killen's precious stockpile of cypress staves salvaged from a brewery's vats.

ble rot resistance of true cypress. Called bald cypress because the trees shed their needlelike leaves every winter, the wood has traditionally been used to make anything assailed by moisture, including clapboards, shingles, exterior trim, shutters, window boxes, fence posts, piers, even coffins.

Last winter, Bruce Killen, the general contractor for our 1996 project on Nantucket, was astonished when he strolled past a fence he'd extended 24 years earlier on the island's storm-swept north coast. "The extension I'd added was white pine, and it was rotting," he says. But the original cypress fence, erected in the 1890s, "was still good as gold. It's amazing stuff."

When that fence was first built, legions of venerable bald cypress trees clustered in brooding stands along riverbanks and salt marshes of the Southeast coastline and blanketed the boggy reaches of the Mississippi Valley up to southern Illinois. These massive trees sank like anchors when cut down. But colonial Frenchmen in the Mississippi Delta came up with a solution. They girdled trunks with a three-inch groove and let trees dry for up to a year, until they became buoyant enough to be felled and ratted to a mill.

Some sank anyway, which is fortunate because relentless logging long ago wiped out most of these swamp leviathans. For decades, divers have fished the "sinkers" from the bayous the same way longleaf pine is recovered (see May/June 1995), but the prized logs are now "damn near nonexistent," laments Harold Faust, a lumber dealer in Baton Rouge, Louisiana. "I know a half dozen people who have a few thousand board feet, and they will simply never sell it. They'll pass it along to their kids when they die."

Dry salvage from old buildings is also dwindling. One of Killen's suppliers, Tom Adams of Cataumet Sawmill in East Falmouth, Massachusetts, still can't believe his luck in finding 97 year-old cypress tanks at a former brewery. "When I saw those tanks, I was like a hound dog. I had to have them." They yielded 100,000 board feet of three-inch-thick planks. "It was golden, almost a honey color," he says. "I've only got about five thousand feet left."

These days, bald cypress still arches over the South's lazy streams and tidal swamps, but most is second or third growth and yields a lumber rated by the Forest Service as only "moderately decay resistant." Gary Barnes of Barnes Lumber Manufacturing in Statesboro, Georgia, mills newer logs—average 70 years old, 18 inches in diameter—for $1.50 per board foot. He says old-growth sinker or recycled goes for "three or four times as much—whatever somebody is willing to pay." While conceding that "the quality of the new stuff isn't what it once was," Barnes says second growth cypress is still a popular choice for clapboards and molding. "One big advantage is that it holds paint very well."

That's partially due to the wood's

Turn-of-the-century loggers waited for floods to harvest girdled cypress. "No idle man was found on shore," wrote an Alabama work-camp visitor in 1889. "Everybody who could swing an ax, paddle a boat or pilot a log was in the swamp engaged in felling and floating cypress timber."

TOP PHOTOGRAPHS BY KEN KOLHEI. BOTTOM COURTESY OF FLORIDA STATE ARCHIVE

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Cypress marries subtle beauty with an obstinate refusal to rot, swell or shrink in moist environments—the perfect combination for the ceiling over this home pool in Statesboro, Georgia. The job required 6,300 board feet of V-joint tongue-and-groove cypress planks.

remarkable stability in changing humidity. 'Many other woods will expand and contract so much they eventually develop checks that can be entry points for fungi," says Richard Jagels, a forest biologist at the University of Maine. In Barnes's own house, he's lining his shower stall in second-growth planks, confident it won't swell or rot once sealed with a penetrating oil.

For carpenters who work with bald cypress of any vintage, the wood has additional charms. A typical board ranges almost imperceptibly from light olive to sienna but can be predominantly yellow, red or chocolate in hue. Some is pecky—marked by whorls of fungi. It weighs little more than pine, but tight growth rings give it solidity and strength. A good plane can shave long translucent ribbons, light as paper, that smell like fresh black tea. "It spoiled me," says Tom Clark, who made frames and sash from sinker cypress for a restoration at the Hill County Courthouse in Hillsboro, Texas. "I never want to work with anything else."

What's in a name?

Bald cypress goes by many informal names. The U.S. Forest Service has found 28 American appellations, including tidewater red, upland, knee, Louisiana, Gulf and southern cypress. In their swampy habitat, the trees send up knees, right, that act like snorkels, bringing oxygen to the underwater roots.

In these difficult conditions, cypress grows with unimaginable slowness. Some trees add just six inches to trunk diameter in a hundred years. The tallest now on record is an 85-footer in San Benito, Texas.

For details and sources see **Directory** on page 133

TOP PHOTOGRAPH BY J. MICHAEL MYERS; BOTTOM BY RICK OLIVER

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Saddle Up!

Sawhorses that fold and go

BY MARK FEIRER PHOTOGRAPHS BY JOSHUA McHUGH

The woodworker's bench—stationary, thick-timbered and loaded with vises—is revered in books and prized by museums. But the carpenter's sawhorse—splay-legged, low and easy to tote—has been ignored. You won't even find one at the Smithsonian.

Oh, they're around somewhere, hidden beneath stacks of plywood or rafter stock. All muscle and no ego, they're indispensable jobsite tools. "If they don't arrive on the job first thing," says *This Old House* contractor Tom Silva, "someone will be after the guy who forgot."

As a young carpenter, Tom built his own sawhorses, but not anymore. Spruce boards and 2x4s don't last long after being cut,

When folded, these portable sawhorses easily fit aboard pickups or in basement shops short on elbow room.

Horse of a Different Material

Made from recycled plastic, with a fold-down shelf for supporting tools. Legs on some models are reinforced with aluminum tubing. Weight: 12 lbs. Rail length: 30"

battered and left in the weather. "We'd only get two, maybe three jobs out of a horse before we cut it up and tossed it in the trash." Clumsy to load and unload, they also gobble up storage space. That's why Tom buys the kind that fold. "A folding sawhorse is a great animal," he says.

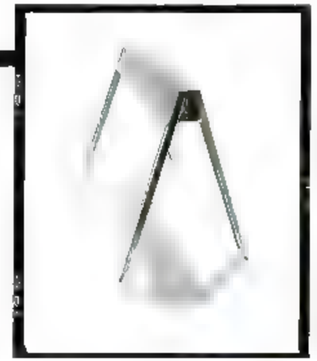
He steers clear of cheap ones made with 2x4s and flimsy metal brackets. "They're a waste of money. They loosen up and break down and always wobble." Tom's folding horses weigh about 11 pounds each, and their tube-steel legs collapse so neatly that six or eight take up as much space in his truck as just one of his old horses.

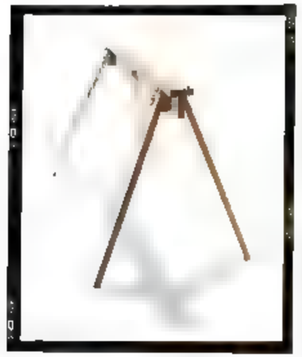
Before using any sawhorse, Tom checks its stability. "I set it up, lean on one end and wiggle it. If there's any sway the long way, it's junk." Even a steady horse can buckle if loaded unevenly, so Tom centers weight between the legs and provides them with solid footing. "Outside," he says, "we put the legs on plywood or lumber so they won't sink in the dirt." On uneven terrain, some horses self-stabilize. With a push on the rail, all four legs touch the ground.

Adapting sawhorses to the job is a long-standing jobsite practice. Tom protects his with a "cheater," a 2x4 screwed to the top rail that can be replaced after accumulating the inevitable saw kerfs, paint drips and glue. Plumbers hack V-notches in theirs to rein in pipe. Painters lay planks on horse backs for impromptu scaffolding. A pair of horses and some plywood make a cut and paste table for wallpaperers. At lunchtime, no matter what the trade, one horse seats two. And as many 7-year-olds can tell you, two sawhorses and a blanket make a great hideout.

Light Horse

Rails and legs are 22-gauge galvanized steel; crossbrace is aircraft-grade cable. Hook-and-loop strap holds folded legs, doubles as a carrying handle. Self-stabilizing. Weight: 10 lbs. Rail length: 32½"





Maple Mustang

Self-stabilizing maple horse with weather-resistant finish and steel folding mechanism. Support rail slotted to form carrying handle. Weight: 16 lbs. Rail length: 43"

High Horse

Tubular steel with rust-resistant powder-coat finish. Each pair of legs can be independently adjusted from 28⅛" to 38¼" high. Weight: 22 lbs. Rail length: 32"

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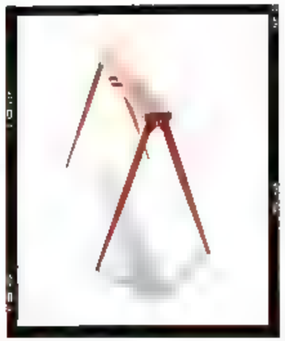

Steel Dray

A 14-gauge horse with powder-coated finish; includes carrying handle. Some versions have adjustable legs. Self-stabilizing. Weight: 15 lbs. Rail length: 38"

Two-in-Hand

Two steel horses with baked-enamel finish and green anti-slip top lock together into a single package with carrying handle. Self-stabilizing. Weight: 14 lbs. Rail length: 42"

Nonskid Hooves

A pair of tubular-steel legs bolt to lumber of any dimension. Legs have rubber nonskid tips. Weight: 11 lbs. per set (without lumber)

Headless Horse

The 18-gauge galvanized steel legs clamp to owner-supplied 2-by lumber of any length. Self-stabilizing. Weight: 5 lbs. per set (without lumber)

For details and sources see **Directory** on page 133

Heirloom Horses

For finish carpenter Dan Meyers, the quest for the perfect sawhorse began 40 years ago, when a fellow tradesman lugging horses through a doorway punched a hole in a wall. As Meyers repaired the damage, he started thinking. Twenty years and hundreds of prototypes later, he finally built a wooden folding sawhorse that satisfied him; by 1976, he'd patented the design and started the company his daughter Tracey now runs.

A Meyers maple Porta-Fold is stiff, light and spare in the manner of a Shaker table. Its legs won't scratch finished floors, and they can be shortened without compromising strength. Holes at either end of the rail hold bench dogs, turning the horse into a slender workbench

The Porta-Fold isn't easy to fabricate. "Each one requires 119 cuts," Tracey Meyers says. No maker of metal horses can match one Meyers service: "Sometimes people come in with wood from a tree they loved. We can usually be talked into making a horse out of it."

PHOTOGRAPHS BY DENNIS MARSICO

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Earth Movers

The Art of Shovels and Spades

BY JEFF TAYLOR PHOTOGRAPH BY KELLER & KELLER

Traditionalists favor the feel of a wood-handled shovel. Slick fiberglass handles are heavier, says *This Old House* landscape contractor Roger Cook, "but I can get two years out of fiberglass, compared with three to six months for wood." Cook also chooses blades made with 12-gauge steel, an industrial grade that won't flex or crack as readily as thinner metal.

Shovels are for building civilization and fixing it when something goes wrong.

Shovels helped dig the foundations of Chernobyl, and shovels helped bury its glowing hot debris. They are blue-collar tools, farmers' friends, gardeners' staffs, soldiers' weapons of last resort. Shovels do the dirty work.

I come from a long line of shovelers and spadesmen. My ancestor Benjamin Isaac Tyler dug his first ditch in Ireland and his last one in America. During the war, my father used a collapsible shovel, an "entrenching tool," to become a gopher during mortar barrages; in peacetime, he could excavate a septic-tank hole 8 feet wide and 10 feet deep in one day, by himself, using only a

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*Based on an average of consumer reported problems in 3 leading ownership surveys of Ford and competitive models designed and built in North America. Sales leadership based on Divisional sales

Digger's Dozen

In 1898, Frederick Winslow Taylor of Bethlehem Steel Works in Pennsylvania made a discovery: By customizing blades to suit the type of coal being shoveled, 140 men could do the work of 500. Now, 99 years later, there's a shovel for almost every digging task.

PHOTOGRAPH BY BENJAMIN OLIVER

The British—whose official standards for digging tools exceed 25 pages—have never confused a spade with a shovel. Spades are for slicing, edging and trenching; shovels move dirt, sand and snow. English spades, the gardener's gold standard, have unbreakable forged-steel blades that cut roots, pry up rocks and can withstand a firm stomp on the step. Tradition calls for short shafts of hickory or ash topped with a D- or T-handle, though fiberglass is making inroads.

shove. Whenever my dad started digging, neighbors gathered along the fence, mouths agape.

Those shoveling genes are now mine. There's a shove. in my hand nearly every day. Excepting only the flensing spade (used to deb-ubber murdered whales), I have used and collected its many variations. snow, mait. square, salt, ditching, fireplace, coal, clam and scoop shovels, and every kind of spade known to gardening science But if you ask me the ditference between a spade and a shovel, I'll clear my throat and reply with unequivocal ambiguity "A shovel blade is often heart-shaped, to cut deeply, and almost always concave. A spade's is usually square and flatter " There are, however, curvy spades and flattish shoves. Many say all spades have short D-handles; but some spades don't, and a scoop shove. does, so many are wrong.

Handles are mainly two feet long with a D end or four feet long with a knobbed end. Aside from those used to move plutonium, scoop shovels have the shorter handle, best for lifting loose material such as grain or sand Long handles give extra leverage for breaking sod and work well for the meditative state known as "leaning on the shovel." Traditionally, handles are turned from ash or hickory, but wood is susceptible to weathering and rot, especially at the socket. Sooner or later, it breaks. Fiberglass hand es are making reluctant converts out of people like me, who love the feel of wood but not the sound of handles snapping.

Using any shovel all day will make your back sore all night, if not forever The human spinal column was not designed to twist and torque repetitively under heavy loads, which can throw out the back from sacrum to C-1. Obviously, a decent self regard requires attention to form taking frequent breaks and small bites, never more than five pounds, positioning the wheelbarrow so you don't have to turn to fill it, and avoiding abrupt or violent movement. I have seen reckless individuals attack hard ground by leaping on the shovel with both feet as if on a pogo stick. I have tsked-tsked sympathetically when their disks ruptured like tiny water balloons. I work slowly, patiently, like a sexton. Do thou likewise.

For shoveling style, a nylon lumbar support brace reminds me that my spine is almost half a century old and made of porcelain. Heavy steel-toed boots protect the arch of my digging foot, and supple leather gloves guard my paws from splinters, boo-boos and blisters. With all my safety armor, I may look and feel a bit silly, but the loss of dignity doesn't compare with that of back surgery and bedpans.

All my shovels get periodic honings with a flat mill file on the inside bevel not razor-sharp, just a clearly defined edge. At the end of every job, I spray them with oil and store them inside the shed Once a year, usually at the end of summer, those with wooden handles receive a loving coat of boiled linseed oil The fiberglass-handled shovels are stored out of the weather and kept clean but otherwise ignored

In any given year, I move about 20 tons of gravel, three tons of garden soil, two of manure, and maybe half a ton of potting soil onto or around my garden My fiberglass-handled shovel gets almost daily use until the start of gardening season. Then I set it aside to indulge in a classy English spade from the forge at Wednesbury. It's heavy, made to last a lifetime and costs many pounds sterling, but it lends an elegance to my delving At day's end, the laird wipes his brow, resting on the oiled ash handle as gloaming o'ertakes the moors.

Ergonomic studies show using a long handle and the lightest shovel can lessen back strain. Most shovels are about 4 to 5 pounds (although we found a solid steel spade that weighed in at 8 pounds). Blades come in two basic types: round points for piercing soil, square points for moving loose materials or cleaning up. Exotic variations include the non-sparking, copper-alloy safety blade; the sifting blade; the toothed root-cutting blade; and the oversize scoop for fluffy snow.

For details and sources see **Directory** *on page 133*

Good Day, Sunshine

Stop depression—install a skylight

BY NANCY STEDMAN

Because they face the heavens, skylights transmit 30 percent more light than vertical windows of the same size.

Poised on a ladder near the ceiling, *This Old House* contractor Tom Silva is cutting an opening to the sky. In his hands, a loud, long-bladed reciprocating saw slices through the plywood sheathing, the roof shingles and any nails in the way. Coarse bits of sawdust snow on his head and upper body, speckling his mustache and a most obscuring the "Tom" stitched on his navy blue sweatshirt. The smell of just-cut wood permeates the air. So does the sound of the saw.

Less than 10 minutes later, as Tom nears the end of the cut, he balances the sagging roof panel on his head to keep it from crashing to the floor. His saw stopped, he quickly pushes the piece up to his nephew Charlie Silva, crouching on top of the roof, who pulls it through the hole. The sudden updraft ruffles through Tom's short graying hair. Light pours in, transforming the austere construction site—a change so swift and startling that the observers in the room gasp. A small smile flashes across Tom's lips. "This," says the veteran of 200 skylight

JOHN TERRENCE TURNER/FPG

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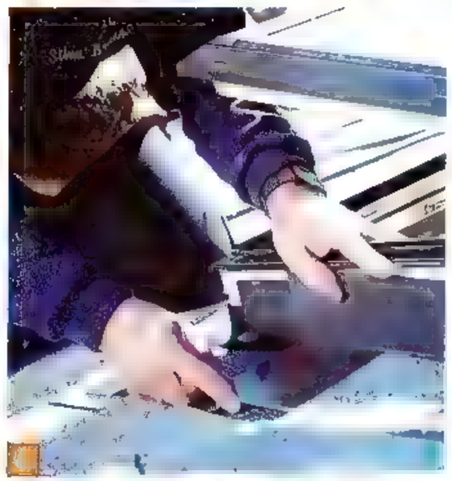
Light work



1. With the doubled rafters (A), headers (B) and plates (C) in place, Tom Silva saws open the roof. 2. From atop his ladder, he slips a one-piece aluminum head flashing underneath the shingles. Plastic flashing is quicker to install, but he prefers metal for its durability. 3. The skylight, its anchoring brackets already in place, comes through the hole in the roof ready to mount. 4. After centering the skylight in its opening, Tom screws it to the framing underneath. "Make sure you use all the screws provided," he says. 5. Step flashing weatherproofs the skylight's sides. Working from the bottom up, Tom aligns the lower edge of each piece with the lower edge of the overlaying shingle, nails the flashing to the skylight, then renails the shingle to the roof, making sure not to puncture the metal. The next piece of flashing goes over the first shingle and under the next—lower edges again flush—and so on. 6. Aluminum counterflashing covers the step flashing, ensuring a watertight seal. Tom screws the corners together for a snug fit.

installations, "is the most exciting part."

Bringing nature's light indoors is what skylights—windows that sit on the plane of the roof—are all about. Unlike the pale light from bulbs, the full spectrum rays skylights admit keep plants perky, fend off winter depression and make people and their surroundings look better. "A skylight takes a dark spot or a small spot and fools you," says Tom, who has 11 in his house. "It gives the illusion of a bigger space."

Light-hungry homeowners in the United States install about 1 million skylights every year—a jump of more than 150 percent since 1982. A big reason for their popularity is the speed of installation. It takes Tom just a few hours when he's working with new construction, remodeling jobs may take half a day to a day because he first has to find a location that doesn't interfere with vent pipes or plumbing. "It always happens that where you want to put the skylight, there's something in the way." A cathedral ceiling like this simplifies the process. Otherwise, he has to build a skylight shaft between ceiling and roof.

Although skylights have been around since Colonial times, dormers were easier to weatherproof and so became the most common method for penetrating a roof. Dormers are still the most visually appropriate solution for an old house, compared with the glassy shoebox top-look of a skylight, but they aren't within reach of every budget: even a simple dormer takes at least a week to build. For this project, an addition to a circa-1900 home, the owners did their part to preserve their neighborhood's historic character. They made sure all the skylights faced the back.

According to Tom, framing a skylight's opening is the trickiest part of the process. Using the manufacturer's rough opening dimension as his guide, he first cuts out sections of two rafters, then nails a doubled header and plate (all the same dimension as

PHOTOGRAPHS BY MICHAEL MYERS

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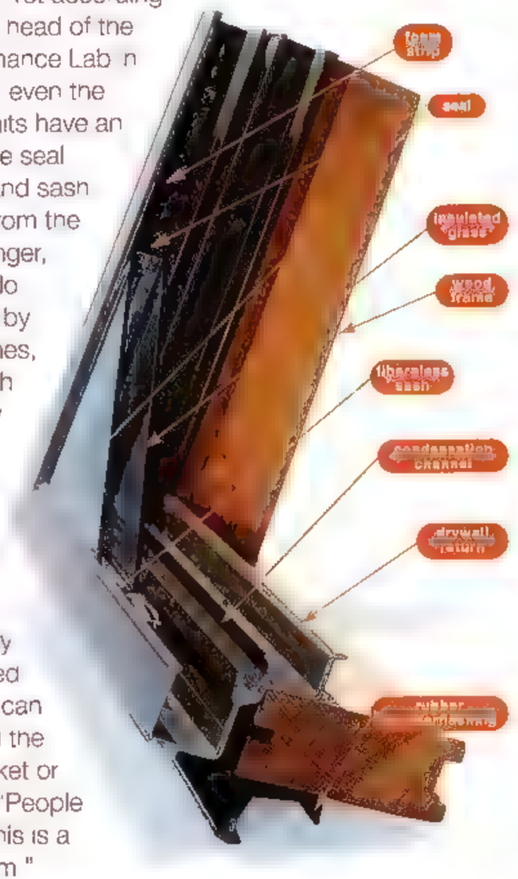
Sun in, rain out

Thomas Jefferson installed skylights at Monticello, but they didn't become popular until the 19th century, when "roof windows" turned attics into cheap living spaces. "They were notoriously leaky," says Sharon Park, a historical architect for the National Park Service, "and, due to their single glazing, often had problems with interior condensation."

Modern skylights are drier and tighter. They benefit from such improvements as double- or triple-pane insulating glass, heat reflective, low-e coatings that keep winter heat in, summer heat out and absorb ultraviolet radiation, long-lived silicone or EPDM gaskets that seal the gap between sash and frame, and built-in condensation channels that stop interior drips before they dissolve drywall.

The frame of a properly flashed skylight should last as long as the roof itself. Yet according to Randy Smith, head of the Window Performance Lab in Calgary, Alberta, even the best-installed units have an Achilles' heel: the seal between glass and sash. Seals shielded from the elements last longer, Smith says, as do those protected by UV-blocking panes, but "after enough freeze-and-thaw cycles, they will inevitably get brittle and crack." He recommends checking skylights annually. In a well-designed unit, the glazing can be removed and the worn-down gasket or caulk replaced. "People have to realize this is a maintenance item."



Urethane foam seals the gap between frame and skylight, preventing water from collecting on the flashing's underside. "A lot of people think their skylights are leaking," Tom says, "but they're really condensing on the inside."

the rafter stock) against the cut ends. These support the skylight top and bottom. Next he doubles the severed rafter sections and toenails them to headers and plate. If you remove structure and don't replace it, he says, "over time, you'll get a sag in the roof." Tom is emphatic that people understand how to reinforce their roofs. "If there's any doubt, don't make the cut."

The last framing step—Tom's own innovation—is to drill one-inch holes in the rafters near the header and plate so air will circulate around the skylight. "You don't want any dead-air spaces in the rafter bays," he says. "The roof could overheat or get moldy."

Still standing on the ladder, Tom pries out the shingle nails next to the opening, then gets the nose of his air-powered nailer under the shingles and fastens the roof sheathing to the new frame, an important yet often neglected step.

As Charlie screws four L-shaped anchoring brackets to the sides of the skylight, Tom slides the head flashing—a continuous metal unit supplied by the manufacturer—under the shingles at the top of the opening. Proper flashing is the secret to a leak-free skylight. "If you rely on caulk or roof tar to

LEFT PHOTOGRAPH BY DARRIN HADDAD. RIGHT BY MICHAEL MYERS

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The price of sky

What's a square foot of sky worth? It depends how souped up the skylight is. Take a no-frills fixed skylight—one that doesn't open—with a 21½" x 27½" frame. With its three square feet of unobscured glass and suggested retail price of $116, you're paying about $38 per square foot of celestial view (installation extra).

But an unadorned, fixed skylight can provide an unpleasant lesson in the greenhouse effect. Heat gain, especially in summer, is potentially stifling. So you might move up to the cooler comforts of a ventilating skylight, operated from below with a long cranking rod and enhanced with heat screening glass coatings or blinds. The extra hardware cuts into the view, shrinking the daylight area in our example to 2⅓ square feet and inking the price to $333. The cost of daylight more than triples, to $143 per square foot.

If you're unwilling to crank, there's yet another option: Spare the rod and spoil yourself with a motor, activated from a wall switch or remote control. You can also throw in an electronic rain sensor, which automatically closes the skylight, and battery backup. The rate per square foot of this high-tech slice of heaven? A lofty $381.

keep out water, the way people used to, you're asking for trouble, big time," he says. In 15 years, he's never had a problem with the sky-guts that have one-piece skirts of soft PVC ("They're very fast to put in"), but for best long-term performance, he prefers those with metal flashing.

On this sunny but cold afternoon, Tom climbs up to the roof, and he and Charlie muscle the 62-pound, aluminum-clad skylight through the opening. They push the unit into the head flashing, ease the brackets under the shingles, and after centering the unit, screw the brackets to the roof. Then they nail the one-piece bottom flashing to the skylight. Normally, at this point Tom would also lay two 12-inch-wide bitumen strips, or splines, alongside the unit and under the shingles to prevent water from getting around the step flashing. But since the roof is already bitumen-covered, splines aren't needed.

Step flashing, the interleaving of metal and shingle along the skylight's sides, is next. It's slow going, but as Tom works up the roof, he falls into a rhythm that obviously gives him pleasure. The last pieces are tucked into the head flashing, then all the flashing is overlapped with counterflashing, making it weathertight.

But not drip-free. So back Tom goes inside the house, where he sprays foam in the crack between the frame and the skylight. Foam insulates the metal on the roof from humid interior air, which might condense and stain the ceiling. Installation complete, he attends to the last step of the building process—ordering lunch.

Tom's skylight tips

- **Double all the framing supports.**
- **Fasten the roof sheathing to the new framing.**
- **Flash with metal.**
- **Overlap step flashing at least three inches.**
- **Don't put copper flashing next to aluminum cladding.**
- **Never nail through flashing into a roof.**
- **Foam-insulate the perimeter.**
- **Lubricate hinges with lithium grease.**
- **Paint or varnish exposed interior wood.**

DARRIN HADDAD

For details and sources see **Directory** on page 133

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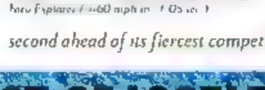

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sport-utility vehicles, besting the Blazer on turning stability and conquering the Grand Cherokee on gas mileage. So this time, we set our sights on a brand-new challenge: beating the Ford Explorer and its standard V6 on zero-to-sixty acceleration. Now at first glance, our 2.5-liter boxer engine may have appeared to be no match for such a formidable opponent. But thanks to the added traction of full-time Subaru All Wheel Drive, the feisty Outback

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	Subaru Outback	Ford Explorer XLT	Chevrolet Blazer LT	Jeep Grand Cherokee Laredo
EPA fuel economy city/highway mpg	21/27	15/20	16/21	15/19
0-60 mph in seconds	7.3	9.7	8.3	9.5
Cargo capacity behind front seat/behind rear seat in cubic feet	40.2/45.3	39.9/42.4	39.5/42.2	28.4/34.4
Towing	5,700 lbs.	5,000 lbs.	5,000 lbs.	5,000 lbs.

Of course, speed isn't the only reason the Subaru Outback is off to such a fast start with car buyers. Its unique hybrid design combines the smooth ride and fuel economy of a passenger sedan with the rugged capabilities of a sport-utility, for a driving adventure like no other. There's also the added security of the Subaru All-Wheel Driving System™ which allows the Outback to constantly monitor changing road conditions and transfer power from the wheels that slip to the wheels that grip. You'll find plenty of other safety features, too. Including four-channel ABS, side-impact beams, crumple zones and standard dual air bags†

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Peerless Pillars

Adding the wrong columns to your house is worse than leaving it alone

BY DENNIS WEDLICK

Simple Doric columns give the appearance of holding up the roof of a house by architect Dennis Wedlick, who is fond of inserting columns into his residential designs.

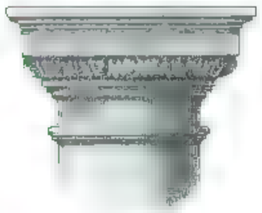
PHOTOGRAPHS BY MICHAEL FREDERICKS

The facade of a classic Cape Cod, perhaps the most popular style of house in America, is sweet but undeniably plain. So up and down Lovely Lane in fix-up-crazed suburbia, many Codders have decided that columns are the perfect addition for a visual spruce-up—perhaps a pair of Doric columns supporting a trellis over the entryway. This kind of thinking is catching on. Everywhere, from new developments to established old neighborhoods, columns seem to be spreading faster than summer grass.

Much more than mere decoration, columns were originally intended to support porches and roofs. As additions to existing houses, they can can add character, define space, magnify good proportions and help turn a look-alike building into a piece of singular architecture. But beware. A quick cruise through a typical columned neighborhood reveals that many of these pillars are strangely out of sync with their parent houses. The Tudor-style home down the street, for example, may have suddenly sprouted two fluted classical columns that look as if they were snatched from the stately center-hall Colonial next door. And to the nearby ranch, someone has grafted spindly posts supposedly supporting a long, flat roofline—an attempt to add character to a boxy facade has become a boxy facade with toothpicks.

The remedy for these awkward attempts

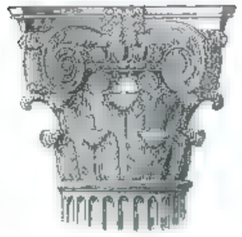
Classical orders



Doric columns originated as whole debarked tree trunks topped by slabs of wood.

The Ionic column's volutes are intended to suggest a woman's curled hair.

Corinthian columns derive from the unfurling leaves of the acanthus plant.



The composite column is a combination of elements from other orders.

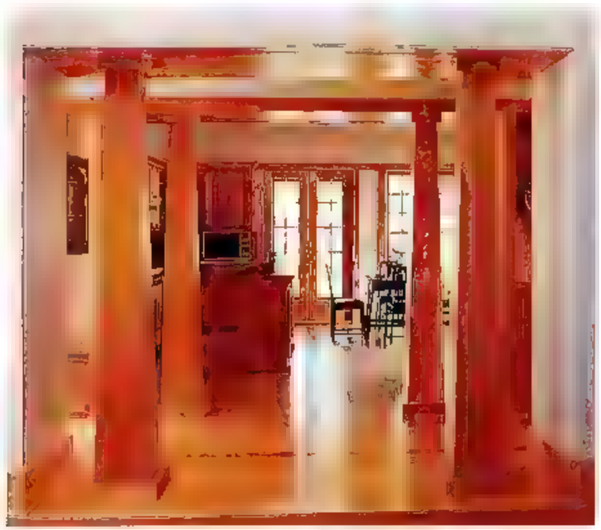
at splendor. Still, do what an architect would do. Consider the columns in the context of the whole house. Be sensitive to proportion, scale, matching the entablature of the column to the soffit above it and to the surrounding trimwork, and, most of all, be attentive to the architectural style of the house. For every architectural motif, there is a particular column that works best.

A classic Craftsman bungalow has columns that are square, not turned, for example, with no-nonsense flat bases and flat caps. That's because a Craftsman house is meant to look as if a carpenter had built it entirely with the saw and hammer he had at hand. A homeowner who is considering adding columns to a stucco Spanish Revival might consult a text of house styles such as *The Visual Dictionary of American Domestic Architecture* by Rachel Carley. There he would discover that a cornice with fluted columns and corbeled brackets, is a time-honored choice. Period photographs are a good source of inspiration, too. Even those ranch houses foisted on the public by developers in the 1950s can be radically improved by adding sturdy bungalow-style porches with columns that project heft, depth and dimension. Square columns are appropriate because, like bungalows, ranch houses are basically rectangular boxes with low-sloping roofs. By contrast, Georgians, Colonials, Federals—even simple saltboxes—beg for classical columns of Greek and Roman origins.

Inside a house, columns are a powerful yet graceful tool for sculpting and defining space. Can't tell where the living room ends and the dining room begins in a free-form, open interior? Nestle a column on each side of the room near the wall, almost as if they were wing walls, to help separate the rooms. The opposite approach is equally useful in the renovation of an old house with too many chopped-up spaces—knock down some walls but keep the definitions of the original rooms with pairs of columns. In almost all cases except a strict restoration, historic reference is not necessary indoors, and simple, smooth Doric columns or square posts are good options.

The best-kept secret about interior columns is that they add to space instead of subtracting from it. Although it seems to the logical mind that the way to create the most open feeling between a living room and a dining room is to keep the spaces clear and free, adding columns between the two makes both seem larger. Upon seeing columns, the eye pauses and gives each space its due.

Most people are so certain this is not true that to convince them I usually lug white-painted cardboard tubes intended for pouring concrete piers into a room and place them where I think the columns ought to go. Only then does a client see that they work. Nevertheless, a final word of caution. Columns shouldn't dominate any field of view, inside or out. A visitor to your house shouldn't say, "Wow, get a load of those columns." Instead, what you hope for is, "Your house looks terrific—what did you change?"



Tapering wood columns in a Wedlick-designed house accentuate openings to a hallway and visually help to connect the rooms on either side.

ILLUSTRATIONS BY ISTVAN ORosz

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Virtual Real Estate

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BY PATRICIA E. BERRY

Jay Perrizo isn't sure how he surfed to the American Finance and Investment Web site, but he's glad he did. He and his wife, Michele, were about to buy their first house, a brand new ranch in Monmouth, Oregon. But before they made an offer, Perrizo wanted to line up a lender. After checking interest rates offered by local banks, he thought he might do better elsewhere, so he got off the phone and got on the World Wide Web. "I wanted some background on loans in general, and one Web site must have linked me to American Finance," Perrizo says. "Their rates were a lot lower than anything I could find locally." So he clicked his mouse on the Apply For a Loan button and filled out an application. Thirty days later, the Perrizos closed on their house with a mortgage from American Finance.

Perrizo figures his research saved some serious money. "We got seven and a half percent on a thirty-year fixed-rate, and the closest comparable was eight percent," he says. "You're talking tens of thousands of dollars in savings over the life of the loan. And the closing costs were a lot lower than others I'd looked at."

Here's why: As the Internet's largest mortgage banker, American Finance and Investment, a subsidiary of Virginia First Savings Bank, gets virtually all its business from its Web site (www.loanshop.com). That means no commissioned salespeople and only one office.

Although he'd heard of online transactions going awry, Perrizo wasn't uneasy about the security of his personal data. He worried more about a long-distance relationship, doing the deal by phone and E-mail. Knowing little about the company also concerned him, he says, but in the end, verifiable customer testimonials convinced Perrizo that American Finance was a legitimate operation.

As Internet security improves, more people are taking a chance on electronic sales. The current standard is SSL (Secure Sockets Layer), created by Netscape, which encrypts data sent over the Net—be it credit-card numbers or financial records. With apparently less to fear on the privacy front, home buyers are enjoying the convenience of shopping for a mortgage, house insurance—even a house—at any time of the day or night and without leaving home.

That was the attraction for Pam Satran. House-hunting, she says, is one of her "favorite things to do in the world," and on the Web she found not only freedom and anonymity—"no salespeople breathing down my neck"—but also the fastest way to get information. Now

ILLUSTRATION BY CHRISTIAN NORTHEAST

For details and sources see **Directory** on page 133

that her husband has taken a job in California, Satran is studying the real-estate market in and around Berkeley.

Her site of choice is Bank of America (www.bankamerica.com). She thinks of it as a virtual one-stop resource, not just for what it contains but also because it links her to other sites. When she logs on, up comes a home page with hot buttons that lead to an array of banking options, tools and information. After clicking the At Home link, she can find current interest rates, learn about selecting a loan, calculate what she can afford and fill out a loan application. The Home Buying button leads to information about closing costs and tips on moving, evaluating schools and choosing a broker. Satran particularly likes the links to listing services, such as Internet Homefinder (www.homefinder.com) and Homes and Land Electronic Magazine (www.homes.com), which she gets to by clicking on the Net cetera button and then on the state she wants to explore. At www.fsboconnection.com, she can look at for-sale-by-owner listings.

Karen Shapiro, who developed the Bank of America site, says, "We set out to help people by building in a lot of resources. Because the bank does mortgages in all fifty states, it made sense to show customers which homes are for sale."

The listings are incomplete, to be sure, and while shopping for houses on-line isn't a trend, brokers find the Web useful for attracting buyers and sellers. At the Coldwell Banker site (www.coldwellbanker.com)—and those of most other national real-estate chains—one can click on a state, type in the specifics of a house (location, price range, number of rooms, etc.) and get a list of properties with photographs, dimensions and agent names, some with E-mail addresses. For those with long-distance relocation woes, nothing compares.

Say, for example, that Don and Dottie Smith are moving from Miami to Chicago and want to find out about nearby Evanston. They can do a general Web search or use one of several indexes, such as Yahoo!, Lycos and Excite, all of which provide well organized regional listings. Whichever route they take, they'll not only find sites for agencies but also for restaurants, the Northshore Concert Band, local businesses, hotels, the Evanston Public Library—which also lists private and public schools and child-care facilities—, a mortgage company and churches.

Impersonal? Not necessarily. A few years ago, Pam Satran and her husband, Dick, were following their dream of moving from a New York City suburb to the New Hampshire countryside. When they found a house they loved, they got serious about making the leap. But after several house-hunting trips, Satran still felt the need to make sure this was the right town. She logged on to America On-line, searched its membership directory for residents of the area and sent E-mails to some of them.

Her questions about the school system prompted one resident's electronic reply that many parents sent their children to private school because the public schools were so poor, and that she was selling and moving elsewhere because her children had no one to play with. The Satrans decided to stay put.

"Yes, it's fun to apply for mortgages and shop for houses on-line," Satran says, "but what's difficult is getting a feel for what life is really like in a place. The people who responded had no vested interest in my moving there, so I knew I could trust them."

For buying and selling, the Internet is not much more than a sophisticated research tool. But it won't be long before it becomes indispensable, particularly for those in a hurry. In five years, immediate loan approvals should be de rigueur. It's already happening, says Jack Rodgers, president of American Finance. In a technological marriage with Fannie Mae—a government sponsored purchaser of home mortgages—American Finance can now provide contingent approvals on-line "in five minutes," Rodgers says. Other lenders will follow or risk losing customers. The World Wide Web will also become a worldwide multiple-listing service, with postings of every available property and virtual-reality house tours.

As for face-to-face transactions involving lots of signatures, they'll be history. "Eventually, there will be other ways to authenticate someone's identity," says Bank of America's Shapiro. "You won't have to come in or visit a notary to prove you are who you say you are." In this brave new world, you might sign those documents with an encoded, forgery-proof smart card or digital certificate. Of course, after any round of virtual buying or selling, you'll still need a real mover.

More sites worth seeing

- **International Real Estate Digest (www.ired.com)** An electronic magazine that explores real-estate issues with articles such as "How Are Buyers' Agents Paid?"
- **Inland Mortgage (www.mortgagemart.com)** A conventional lender with offices in 27 states has expanded its reach with this tool- and information-loaded site, complete with links to brokers nationwide.
- **Keystroke Financial Network (www.keystrokenet.com)** Besides common features like a payment calculator and interest-rate listings, this lender has a Home Price Analyzer. For $7.50, you input information on your house and get back an estimate of its market value.
- **Cyberhomes.Com (www.cyberhomes.com)** The closest thing to an on-line multiple-listing service, this real-estate clearinghouse covers nearly 50 metropolitan areas nationwide, is updated daily and gives street-level mapping to help pinpoint property locations.
- **Virtual Real Estate Tours Inc. (www.vret.com)** Walk-throughs at this site give several views of Seattle-area houses, plus maps, school and community information and links to agents.
- **Boston Com (www.boston.com)** Want to meet the locals? Check out their Web sites, which are linked to this comprehensive town-by-town guide to the greater Boston area.
- **Steve Hatfield (www.steve-hatfield.com)** This Michigan Century 21 agent reaches out to house hunters with a tour of historic Dearborn, tips on avoiding lead hazards and ways to lay out your new home. There's also a loan amortization calculator, a downloadable home inventory program and other free software.

No Ordinary home.
8:05. Porch light on.
8:00. Kids' light on.
7:55. Aptiva® turns itself on.
10:30. Driveway light on.
Introducing Home Director.™ Now you can manage lights and appliances from your home PC. Even set up routines so you can give your house that lived-in look when you're not at home. Simple to install and even easier to use, Home Director runs on most IBM or IBM compatible PCs.* Look for it today at a retail location near you, or call 1 800 426-7235, ext. 5216, to order directly. Visit www.pc.ibm.com/homedirector for more information.
IBM

An average washing machine uses 15,597 gallons of water per year.

This is not an average washing machine.

Introducing the water-efficient new Maytag Neptune.

Traditional top-load washers use an agitator to move clothes through a tub of soapy water. The all-new Maytag Neptune, on the other hand, gently lifts and drops clothes into a shallow pool of super-concentrated detergent. Getting your clothes clean and using 40% less water than average washers. And since Maytag Neptune uses less water and energy, you could save nearly a hundred dollars a year in utility costs.

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Savings based on DOE test methods with average conventional washer, average water and sewer rates and 1996 electrical energy rates and dryer savings. Your savings will vary depending on utility rates, model replaced and usage.

A Letter from This Old House

spent my teens in Southern California, where summer means surfing all day without a wetsuit and never wearing shoes. It got hot when the Santa Ana winds blew in from the desert, but the heat was dry, and I didn't care anyway because that offshore wind meant the waves would have better shape.

After California, I spent some time in the Mediterranean, Central America and the South Pacific. I thought I knew what heat was all about. But nothing prepared me for my first summer in Boston 17 years ago.

I still have a ghastly memory of that first heat wave: slabs of steaming air heavy on the streets, oozing through windows, laden with the panting exhalations of half a million weary citizens and the exhaust of a thousand trucks. Five minutes after a cool shower, I was sweating again. After a week of torture, I began to ask locals when it would end. "It's very unusual," each and every one replied. "We only have hot weather for ten days in summer."

I believed them. But the heat spell kept coming that summer, and the next, and the next. Ten "ten days of summer heat" remained the gospel, and after a while I began to preach it too. Then Richard Trethewey saw through my denial. "Hey, California boy, don't anyone tell you? It's hot all summer around here. Put in AC." Soon afterward, a semi loaded with air conditioning equipment rolled up to my house. When I called Richard to protest that I hadn't ordered it, he said, "You'll love it," and hung up. I helped install it and paid the bill.

Somehow it's hard to live in the Northeast and justify the sin of spending hard-earned cash on the foolishly pleasure of keeping my frame cool. After all, parsimonious Yankees somehow got along without air conditioning for more than 300 years. But while my New England neighbors swelter in their beds, tossing in the wash of window fans, I snuggle under my down comforter, lulled through a deep and dreamless sleep by the hum of the air handler in the attic above. Trethewey was right. It is hot all summer around here.

—Steve Thomas

ILLUSTRATION BY BOB HAMBLY

UAW team members Michael Proctor, John Stacy, Kennie Davis and Saturn retailer Doug Axtell. (Hint, he's the one in the coveralls, extra starch.)

What if we told you the person who sold you your car also helped build it?

Teamwork is not something we restrict to the Saturn plant. It extends out into the community, as well. UAW team members are helping raise money for Camp Fish Tales, a barrier-free camp for kids and adults with disabilities. You could help, too, if you want, by calling 517 797 8800.

Every so often, a group of Saturn retailers will come down to Spring Hill, Tennessee, and work the assembly line here at the Saturn plant. Oh, it's not like we have them build engines or anti-lock brakes or anything like that. But they do help put on doors or install seats or help run wires over in the cockpit assembly area. And they do work side by side with the men and women who build Saturns for a living. It's more an exercise in team building than it is a lesson in automobile manufacturing. Although, to be perfectly honest, after a couple of hours, it can get pretty hard to tell a retailer from an autoworker. But then, at Saturn, that's sort of the point.

In the same spirit, Saturn retailers across the country have begun building playgrounds to give inner-city kids a safe and fun place to play. Saturn owners have jumped in there, too. In fact, not too long ago, they all got together and built twelve playgrounds in the New York area in just one weekend. And in the weekends to come? Got a hammer and some free time?

A Different Kind of Company. A Different Kind of Car.

This 1997 Saturn SC2 has an M.S.R.P. of $14,695, including retailer prep and transportation. Of course, the final price will vary some, but options, the extra-cost items like tax and license. We'd be happy to provide more details at 1-800-522-9000 or look for us on the internet at http://www.saturncars.com. ©1997 Saturn Corporation.

P U E B L O

Revival

Roll out the turf and bring on the hummingbirds—the Tucson project is a great success

BY JACK McCLINTOCK
PHOTOGRAPHS BY MICHAEL LLEWELLYN

EVERY DESERT HOUSE needs its own oasis, where water flows, green plants thrive and shade buffers the relentless sun. So this spring, as temperatures rose each day in Tucson, Norm Abram, Steve Thomas and construction workers pushed hard to finish the cooling centerpiece of Jim and Colleen Meggs's Pueblo Revival house—its courtyard.

A broken-down fountain offered echoes of those sacred and refreshing spaces in the Middle East where Muslims gather to wash before prayer. But rejuvenating the fountain would not be enough. The crew from *This Old House* was determined to transform the entire courtyard—visible and accessible from bedroom, library, media room, outdoor kitchen, studio or pool patio—into a distinctly Southwestern refuge. Workers rolled out a little carpet of turf around the fountain, and when the landscaper's truck arrived with the first load of plants, dozens of hummingbirds flew out of the desert and gathered above the massed blooms, veiling the pickup with their agitated blur.

Truck followed truck as landscape coordinator Tom Higgins brought in pots of queen and Mexican fan palms, calendula, bougainvillea, geraniums and Texas mountain laurels. The queen palms, in terra-cotta pots, stood by the courtyard columns where, in time, flowering vines would sprawl. The shrubs and flowers were made comfortable in drip-irrigated, built-in planters, or remained in their pots to throw exotic shadows across the freshly stuccoed walls. The planter nearest the outdoor kitchen got a gardenful of fragrant cooking herbs. In what had been a square of bleak khaki desert, color and life blazed.

"God, isn't it something?" gasped architect Alexandra Hayes the first time she walked into the blooming Eden. But Eden is never pure. Contractor John McCaleb scuffed a toe at the grass and said he had some just like it at home. "The snakes love it." He predicted Jim would soon be tossing a few back over the wall.

A HOUSE WITH TWO KITCHENS

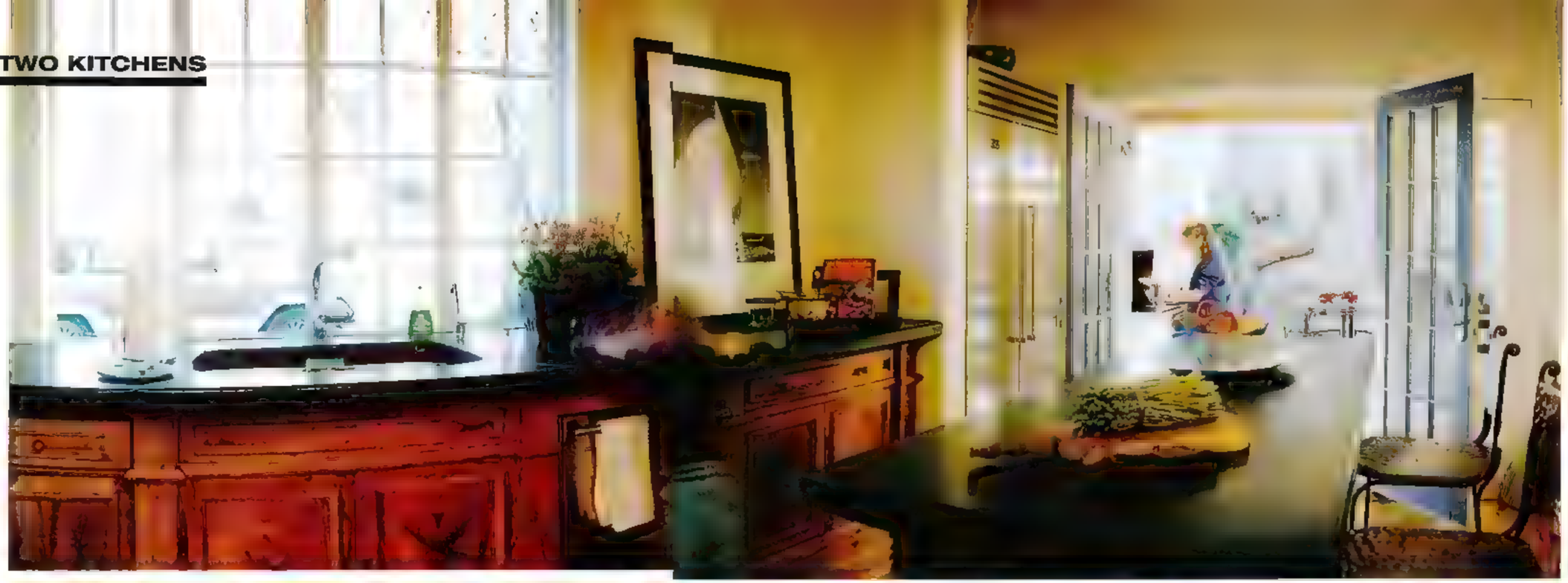
Most houses have at least two bedrooms, and many have two baths. But two kitchens? One indoors and one out?

In Tucson, where social life is largely out-of-doors all year, two kitchens make sense.

The Meigses' indoor kitchen, shown at top with Colleen Meigs visible in the outdoor kitchen, is deliberately compact, a cooks' working space kept to a size appropriate to a Pueblo Revival house. Custom mesquite cabinets and a center island topped with polished black concrete counters evoke the formal elegance of an old Spanish Colonial home. A big, bright steel casement window and stainless-steel appliances add a modern glow. The steel barstools are Mexican, hinting at the informality just beyond the French doors.

In the outdoor kitchen, bottom, the sole touch of modernity is a high-tech natural-gas-powered barbecue grill that contractor John McCaleb describes as "NASA quality." Just past it is the arched door made from the top of a redwood picnic table Jim Meigs built years before, a shady *Rhus lancia* tree and more Mexican ironwork furniture.

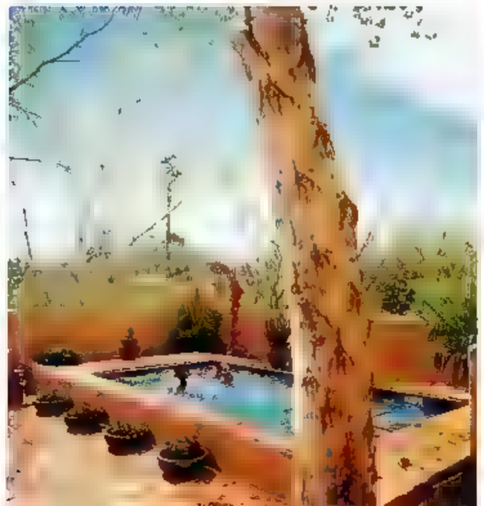
A beehive fireplace flanked by a seating *banco* of handmade San Marcos tile from Mexico knocks the chill off desert evenings and creates a cozy area for drinks and talk. The first night after the house was finished, the Meigses inaugurated the haven with a barbecue.

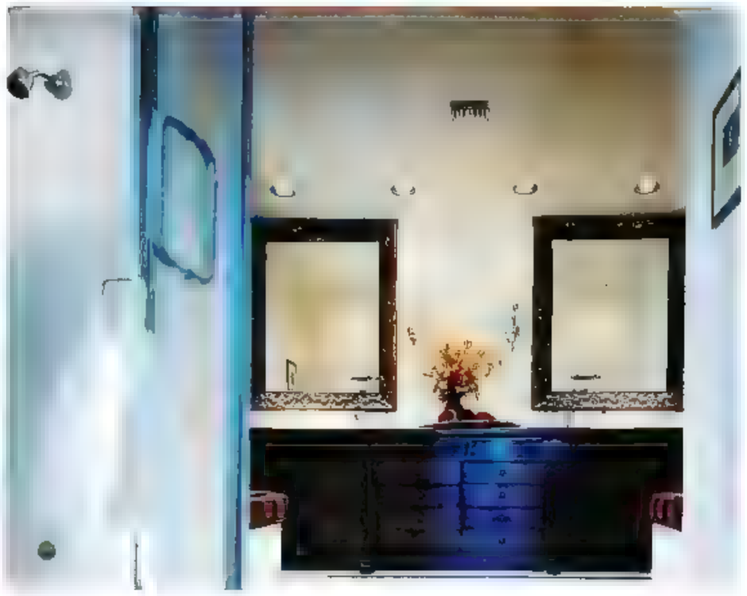


MIDNIGHT AT THE OASIS

Starkly lit against a desert sky, an Australian red-gum eucalyptus, planted in 1929, helps shape the house: The front wall of the new master suite was located to preserve the tree. Respect for the past is evident in everything from the landscaping (most of the plants are desert natives) to the gallery for display of family photos. And the Meigses have taken pains to preserve the style of the house itself, visible here in the lot-treasted walls, roof parapet and neat, small windows.

Curves where ceilings meet walls and recessed lighting add an appropriate softness to Jim and Colleen Meigs's new master bedroom, above. Although she worried the room would be too small and he worried it would be too big in relation to other rooms in the house, both concluded it's just right. Jim designed the Mexican-style precast-concrete fireplace. Colleen surprised Jim with bold red upholstery on the chairs and ottoman, the only furniture added in the remodeling process. The rest of the furnishings are heirlooms, including the Joseph Highmore portrait of the wife and daughter of a Shakespearean actor, a painting that Jim's father bought at Stratford-on-Avon decades ago.





The generous-size master bath, above, includes a steam shower, bidet and two vanity basins under twin mirrors with hand-carved frames. The cabinetry below the countertop is made from alderwood. The cozy private patio off the main courtyard, left, is reachable through curtained French doors in the bedroom (visible in top photo). The focus of the courtyard is an exercise pool in which the swimmer swims in place against a jet of water.

HIDDEN TREASURES

There are no thudding hearts in the walls, but the Meigs house has other telltale clues to hidden compartments.

The cushion of the bay window in 12-year-old Elizabeth's bedroom, below, conceals a hinged hatch in the oak seat, under which she can hide her photo album and dolls.

The black-walnut paneling in the library creates a hushed atmosphere that masks a sense of play. One bookcase is fake, holding a job-lot of old books (*Labor Relations Law, Clinical Cystoscopy*) band-sawed in half and glued into shallow shelves that swing outward on a piano hinge. A wood latch, fashioned in the shape of a book, releases a catch, and the hidden door, inset left, swings open to

reveal a powder room.

Outside on the pool patio, counting six tiles in from the eastern exterior wall and 14 south from the master bedroom door leads to...a nondescript patio tile. But under that tile, and four inches of concrete, is a time capsule—a breaker box filled with memorabilia including used tools, business cards, a handful of currency and coins as well as the May/June issue of *This Old House* magazine autographed by every member of the crew.

♦ For details and sources see **Directory** on page 133

BY JACK McCLINTOCK

PHOTOGRAPHS BY MICHAEL GRIMM

The engine that runs the Triathlon heat pump is fueled by natural gas, cooled by glycol and muffled to a low purr. It will run continuously for a year before requiring an oil change.

a/c

Suppose your gas company calls up one day and offers to install a revolutionary new heat pump that will cut your air-conditioning costs in half. Even better, the amazing machine will replace your furnace too, and save you a bundle on heating costs. Then suppose they say it's powered by a little five-horsepower, one-cylinder engine that looks suspiciously like the one on your lawn mower.

In central Florida, where Bill and Sandy Kirk live, the summers seem to get brighter and hotter every year. The muggy air fills with bugs, molds and pollens, air conditioners suck up power at peak-season rates, and electric bills spike. So when the truck from Crums Climate Control backed into the driveway of the Kirks' Spanish-style house in Winter Park one cool rainy morning this April, the couple thought about the coming dog days and knew they'd made a good decision.

The Kirks watched through a rain-spattered window as workers unloaded their new Triathlon heat pump. It wasn't much to look at: a tan, rectangular, louvered metal box that would squat on a pad in the yard, humming and blowing out hot air. The heat pump would replace their old oil furnace and central air conditioner—which, in fact, it resembled, except for one thing: "It's about three times bigger," Bill Kirk said.

The Triathlon, manufactured by York, did seem bulky, and the Kirks could see the men struggling with its 660-pound weight. But inside the big metal box was a small revolution: a heat pump driven not by the usual electric motor energized through a wire from Florida Power Corp. but by its own one-cylinder Briggs and Stratton engine. And the engine was fueled not by gasoline but by clean-burning natural gas. Combining old technologies in a new way, York had married the not terribly efficient heat pump to the not-always-admired internal combustion engine, creating a hybrid that minimized the flaws of both and maximized their virtues.

Bill and Sandy Kirk expect to cut the monthly cost of cooling their 1,800-square-foot house in Winter Park, Florida, from $220 to $145.

When Richard Trethewey, *This Old House*'s heating and air-conditioning expert, arrived to check out the installation, he saw the advantages immediately. They start with the Triathlon's engine, which, true to its name, was designed for the long run. Test models ran 40,000 hours straight—the equivalent of a car engine running for 1.6 million miles—and showed no discernible wear when dismantled for inspection. With proper maintenance, York says, the engine should last 12 to 15 years.

But the Triathlon engine's greater virtue is that it allows the heat pump to run at 17 different speeds, an enormous advantage over electric heat pumps, which simply switch off or on. "An electric heat pump is like city driving—jerky and inefficient," Richard explained. The compressor switches on, there's a blast of cold air, it switches off, and the air grows warmer and damper. The compressor is cycling on and off all day—or if it's cool outside, as it is today in Winter Park, the thermostat doesn't kick in at all and the house feels clammy and the ducts can sprout mold.

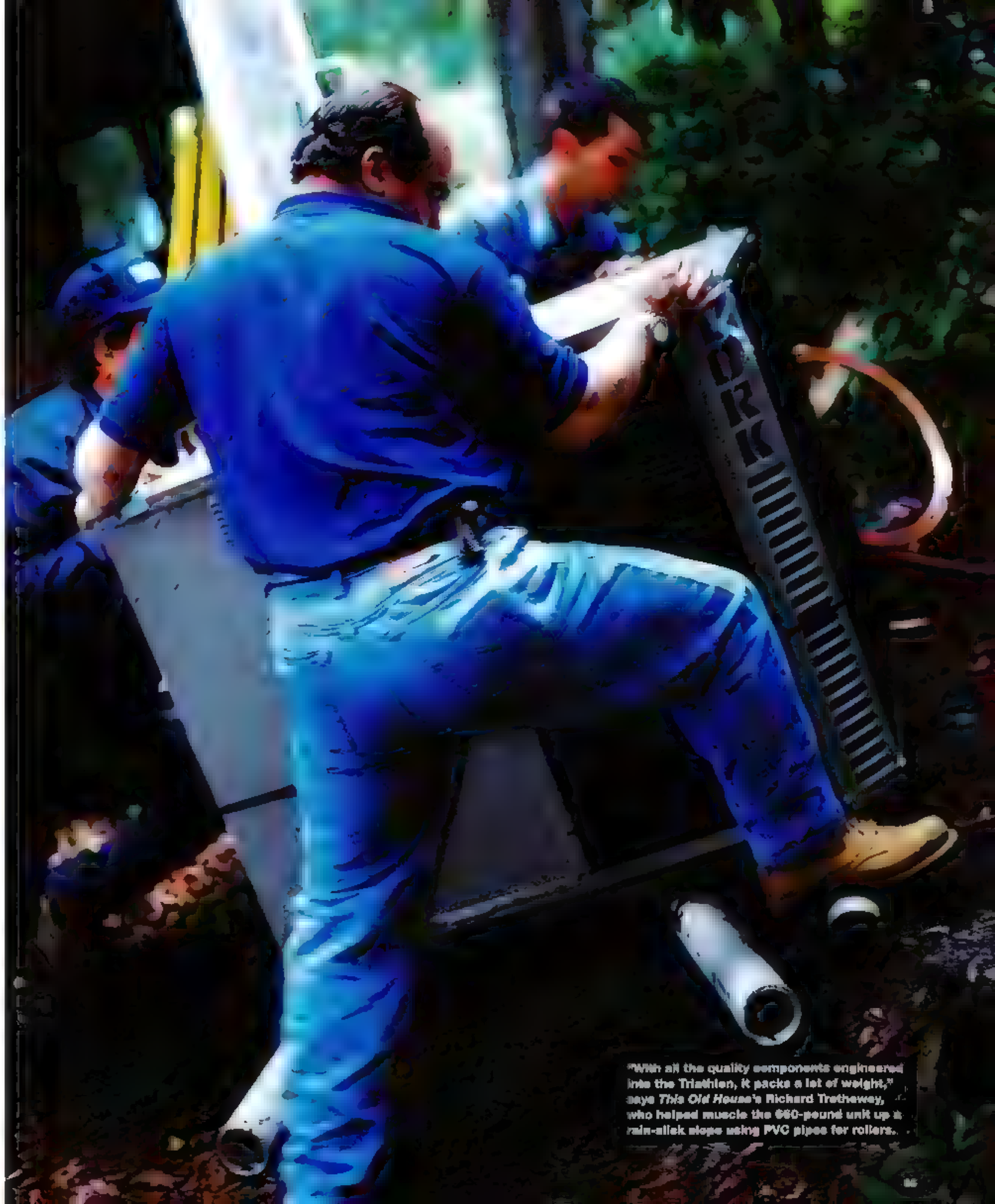
The Triathlon, on the other hand, is like a car on cruise control. Governed by a microprocessor that smoothly matches speed to need, the engine runs slowly for long periods, constantly cooling, pulling humidity from the air, filtering out dust, molds and pollen and saving energy. In summer, when electricity is expensive and natural gas is less so, the Triathlon cuts cooling costs up to 50 percent. In winter, it is cheaper to run and more efficient than an oil or gas furnace or even an electric heat pump. The engine scavenges its own heat and carries it indoors to help warm the house. And rather than consuming electricity, the Triathlon burns its fossil fuel on the spot—saving up to 75 percent of the energy that would be lost in converting fuel to electricity at a power plant and sending it across power lines.

The Triathlon isn't cheap; the Kirks' cost $8,100 installed. But Carol Weitzel, a Peoples Gas System rep in Orlando, assured the Kirks of fuel discounts, deferred payments, interest-free loans and lower monthly bills. Bill Kirk was persuaded by the economics, Sandy by environmental considerations. Since the Kirks would no longer be using their old oil furnace, they could decommission the oil-storage tank buried in the yard just 1,000 feet from Lake Osceola.

While the Crums men tore out the basement furnace and built a plywood platform on which to set the new air handler, Richard and Bill Kirk went outside, where workers had laid a four-by-four-foot plastic pad on leveled ground and dug a trench to the gas meter for galvanized natural-gas pipe.

With the Triathlon resting on its pad, Richard took a look inside. Engine oil would have to be changed annually, along with oil and air filters, the spark plug and plug wire, so designers had placed the Briggs and Stratton neatly in the front corner of the unit. Above it perched the system controller—the microprocessor that would sense temperatures, signaling the engine when to start and how fast to run. The computer could even detect refrigerant leaks and shut off the whole machine. And if the heat pump failed, the computer would "remember" contemporaneous conditions so a technician could plug in a service analyzer, read a fault code and look it up in a book. "Some thought has been given to this," Richard said approvingly. Crums service manager Terry Lingo agreed.

As Richard admired the microprocessor, the men dug a second trench for the copper tubing that would carry refrigerant to and from the air handler in the basement. A heat pump works by extracting heat from the air—there's always some present, even



"With all the quality components engineered into the Triathlon, it packs a lot of weight," says *This Old House*'s Richard Trethewey, who helped muscle the 660-pound unit up a rain-slick slope using PVC pipes for rollers.

The heat exchanger looks like a car radiator and works like one too. It takes heat from the Triathlon's engine and puts it into the house's air ducts, sometimes providing more than half the unit's heat output.

outdoors on cold winter days—and moving it from one place to another using a refrigerant, in this case Freon-22, as a vehicle. The copper tubes were the pathway.

Into the same trench went two more pipes—¾-inch copper for the engine's ant-freeze. In summer, the coolant stays outdoors, circulating there to cool the engine, but in winter, a valve opens automatically and permits it to bring the engine's heat indoors. Because of this, York representatives said the Triathlon is 126 percent efficient in its heating mode: It actually produces 26 percent more Btus in household heat than were burned as fuel to run it. A typical household furnace is about 80 percent efficient.

Back in the basement, the men were building new ductwork to connect the air handler to the air return and the supply plenum. They used foil-faced ductboard, silver foil tape, mesh tape and mastic—but not duct tape. Orange County code prohibits using standard gray duct tape on ducts, calling it a fire hazard. "They're making awfully good connections, sealing all the joints inside and out," Richard observed. "In this business, nothing's ever standard, and you've got to be part sculptor to make it fit."

The men ran copper pipes across the basement ceiling and down to the air handler, then soldered them into place. Two pipes entering at the bottom were the veins and arteries of the heat pump—the refrigerant loop. In cooling mode, the ⅞-inch pipe carries Freon vapor out of the house, taking heat with it. The skinny ⅜-inch pipe brings cold Freon liquid indoors. This coils in the evaporator coil and causes it to absorb heat from the indoor air. Advanced as the Triathlon may be, York decided after market-testing more environment-friendly refrigerants to stick with the ozone-depleting Freon, which is legal in new products until 2010.

Bill Kirk inspected the filter rack, happy to find it conveniently mounted on the bottom of the air handler. The filter, a 59-cent throwaway, can be the heat pump's weak link, says Crums's Brian Wrong. If it isn't changed regularly, airborne gunk builds up on the fan's blower blades, throwing them out of balance, ruining bearings and enriching the dealer's service department.

Upstairs, Sandy Kirk stared at the unit's new thermostat. She was taking her time, she said, because "once I learn it, programming it will be my job." Indeed, operating this thermostat takes concentration. The Honeywell-built device can request different temperatures at different times on different days, but it has to be reset whenever daylight saving time comes and goes. The thermostat use is so complicated, because it has to vary the Triathlon engine's speed, not just switch the unit on and off. Some customers have complained about it wandering as much as 10 degrees from the programmed temperature or failing to hold a program at all, Honeywell spokesmen said. But when returned to the factory, most have tested out fine. York and Honeywell engineers are mystified and still investigating. An earlier problem in the Briggs and Stratton engine—oil leaks—was solved with better quality control over subcontractors who make machined parts. With regular service, York product manager Barry Swartz says, the engine should be trouble-free.

The Kirks now had a cooling and heating system that, if it lived up to its promise, would please them more every year. An energy-conservation discount from Peoples Gas brought the price down from $8,100 to $7,695, of which the utility would finance $1,595 interest-free over the next five years. In summer, natural gas costs a third the price of electricity in central Florida, and the Kirks believe the Triathlon will pay for itself in a dozen years or less.

It had taken 12 hours to install the Triathlon, Terry Lingo called it a routine job except for the rain. As the men finished up inside, Bill Kirk went out and stood beside the new unit, waiting for someone to crank up the Briggs and Stratton and give it a test. He stood in the rain a long time before someone told him it was already running.

Before the Triathlon was fired up, Richard showed the engine, compressor and condenser to homeowner Sandy Kirk. "Unlike other heat-pump or air-conditioning units," he says, "the Triathlon has all of its serviceable parts accessible through one panel."

The arrival of the Triathlon sent the Kirks' old furnace, above, into permanent retirement. That made space for the heat pump's indoor unit, left (shown without its access panels), which houses the blower and the cooling and heating coils. Blower-driven air moves up to the house's main supply duct and returns at the bottom of the unit.

cool savings

Like Bill and Sandy Kirk, Frank and Dorothy Albert of Altamonte Springs, Florida, couldn't resist the Triathlon's promise of big energy savings. They, too, had aging equipment—central air and a gas furnace—and were tired of sweating through frequent summer power outages. The natural-gas-powered Triathlon needed only a small amount of electricity, and whenever the lines went dead, the Alberts' emergency generator could take over. After more than a year of almost trouble-free operation, the Alberts give the Triathlon good marks. It has cut their cooling costs in half—from up to $400 a year to around $200—thanks in part to the summertime gas discount, which drops the price from 82 cents to 57 cents a therm. But their enthusiasm stems from more than money. "There's no comparison [with the old system]," Frank Albert says. "The way it handles the humidity, the house is much more livable. That's the beauty of it."

For details and sources see **Directory** on page 133

Emmanuel Jamali, 10, and Kaza Ansley, 7, sink the final staples on the outdoor run. OPPOSITE PAGE: A carpenter's son, Jake DeMichele, 6, is a powerhouse with a hammer, but these chicks elicit his tender touch.

BY JEANNE HUBER PHOTOGRAPHS BY GRACE HUANG

Bring Home the Farm

Help your kids build a chicken

In framing a wall, 10-year-old Andrew Vitelli discovers it takes many whacks to drive a 3-inch nail.

PAM CARRANO is a true Mary Poppins to many families in the small New York town where I live. We pay her to take care of our children through her Homework Club, a name that's somewhat misleading considering all that goes on at her cozy, 1930s home after school. She shows the kids how to sew on buttons, how to dry apple slices. On warm afternoons, she often leads her charges down the hill so they can swing in a park or help weed a community garden. "I sometimes wonder what people must think—there's that woman with the parasol and long skirt and all those kids."

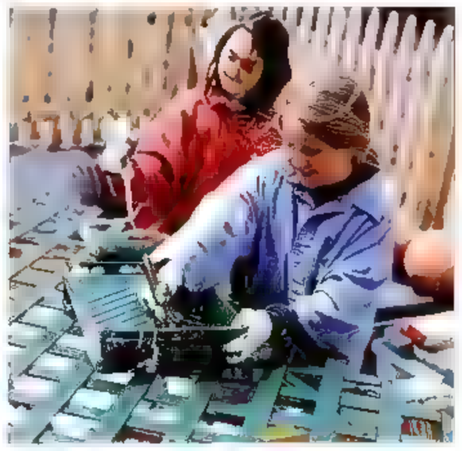
When I signed up my daughter, Carrano discovered we were the family with the chickens she'd heard about, and her eyes lit up. Then Mark DeMichele, a carpenter whose son also attends Carrano's program, volunteered to teach woodworking. An idea began to hatch, and the kids were soon engrossed in building a chicken coop.

Over four weekends, with lots of parent help, they framed the walls, nailed on plywood sheathing and erected an outdoor pen. Everyone joined in mixing the concrete and painting walls, but when the pace slackened, most of the junior carpenters drifted off to play. Carrano's daughter Olivia stuck around and was glad she did. "My favorite part was when all the other kids left so I got to do all the nailing by myself."

When the project was nearly complete and the mail-order chicks were shedding their yellow down in a cardboard box in her utility room, Carrano discovered that a neighbor was opposed to her program. Fearing the coop might be pushing things, she diplomatically farmed out the chicks to a friend upstate—with the understanding she may take them back "when the feathers stop flying." (In the meantime, the henhouse in waiting makes a dandy playhouse.) So it goes. People who blithely welcome yapping dogs and poisonous snakes as pets turn up their noses at hens, fearing odors, noise, flies or rodents. Some communities ban backyard flocks, but where raising chickens is legal, careful husbandry and common sense go a long way toward preventing complaints. "The main issue is cleanliness," says Bart Pats, who raises purebred chickens for show in Mason City, Iowa. "If the city health inspector comes and your place is not clean, no one will be on your side."

One way to combat neighbors' fears is to point out how much a half-dozen hens can accomplish. These pets eagerly gobble down fresh kitchen scraps (although they turn up their beaks at orange peels)—a boon in an era when local governments are trying to cut down on garbage. In return, the hens deliver a daily clutch of warm eggs and fertilizer loaded with nitrogen.

Ten-year-old Olivia Carrano—stationed behind her father, Robert Carrano, and in front of carpentry teacher Mark DeMichele—helps hoist a wall section. Because the coop is built on a steep slope, they assembled the frame on the flat driveway, then carried it to the site.



Chelsea Anderson, 8, in front, and Olivia Carrano stain lattice to be nailed to the walls, a decorative touch for a building near a main neighborhood thoroughfare.

Jake DeMichele supervises as Olivia Carrano finishes painting the coop's half-inch plywood siding. Salvaged windows bring in light, and triangular openings in the eaves provide ventilation.

Best of all, chickens make for great conversation. Adults and children alike marvel at learning why my chickens never crow (they're hens), whether roosters are needed to make eggs (they're not) and why flies are absent (these hens scratch in their own litter, eating any insects they stir up).

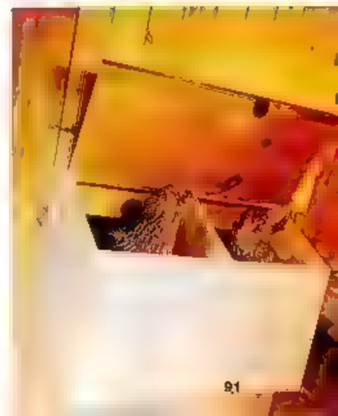
The more improbable the setting, the more fun a flock can be. When I lived in the country, my chickens delighted only me. But when I moved to San Jose, the third largest city in California, kids took such delight in picking up snails and feeding them to the hens—crunch!—that the garden was snail-free in no time. Now I live a half-hour from Manhattan on a third of an acre corner lot where the coop is in full view. Parents and kids stream by on weekends, and one mother says her son eats vegetables only when sharing the broccoli he brings to the hens.

As for chicken feed, it's cheap—less than $10 per hen per year. Building a coop, however, can be costly. Materials for Carrano's setup, including $200 for fencing and $500 for lumber and plywood, topped $1,000. Richard Reynnells, who coordinates youth poultry projects for the U.S. Department of Agriculture, says backyard birds rarely pay for themselves, but that's not the point. "Number one, you're doing this for fun, not to have a lower food cost. It's a learning experience, a family project." And your hens will love you for it.

ESSENTIALS FOR A COOP

Commercial growers give laying hens as little as two square feet of floor space per bird. But backyard hobbyists can prevent problems like cannibalism and disease by providing more spacious accommodations. This coop is 6 feet wide and 8 feet deep, ample for half a dozen hens even if divided into two rooms (one for feed storage, one for the flock). Set on concrete blocks, the ¾-inch plywood floor is sheathed underneath in heavy wire mesh to prevent rodents from gnawing through. A thick carpet of wood shavings will absorb moisture from the droppings and keep the air free of smells and flies. A small flock in a tight coop can keep itself warm enough even when temperatures dip below zero. But in winter, chickens need heated water and a single lightbulb to prompt their egg-laying hormones. Eggs don't happen without at least 14 hours of light each day.

Hens like a cozy spot to lay eggs. This nesting box opens into the feed storage area, making egg-collecting easy.



TOP: Chelsea Anderson smooths the pen's dirt floor, a neat finish that hens will gradually change as they scratch out shallow bowls for dust baths. ABOVE: With a cup of grain, Chloe Carrano, 6, draws a crowd of Araucana hens. Backyard growers can pick from dozens of gorgeous breeds, but this one from South America lays eggs tinted green or blue. RIGHT: Chicken wire is too flimsy to stand up to excited kids, so this run is covered with 1-by-2-inch welded wire. Buried around the perimeter of the 12-by-8-foot cage is a narrow trough filled with concrete to keep dogs, foxes and other predators from digging through when guards like Gaby Cascone, 9, are off duty.

For details and sources see **Directory** on page 133

master framer

Robert Reade does it right even when no one is looking

The young men jump from the vans and land with tool belts clanging, coveralls clean and ready for action, their boots stiff and shiny. Chattering enough that a cloud of fog rises from among them on a chilly Columbus, Ohio, morning, they deploy across a bed of golden straw to a stack of unfinished headers, a mountain of waiting joists, a beam of steel that spans the foundation of a house yet to be built. The men are quick to their work, quick to draw hammers and quick to make mistakes. Then comes Robert Reade, everything about him calm and deliberate. In his left hand dangles a tool belt as old as most of the nine

BY WALT HARRINGTON

PHOTOGRAPHS BY TOM WOLF

men on his house-framing crew, a belt as thick and strong as a saddle girth and fretted from weather and wear. Amid the scurrying, Reade, at age 50, stands with his weight cocked on the right heel of boots that do not shine. He takes a final hit on his Camel, flicks it and, in one seamless motion, swings the belt and its tools around his rump, grabs the puncture in his right hand, ratchets the buckle pin into its eye and seats the whole clanking contraption with an imperceptible tug as he steps over a tire track cradling last night's rainwater. You'd have to be from Mars not to think of a cowboy packing six-guns.

Trusses lay stacked and ready to be lifted by crane onto the roof of a newly framed tract house, one of the 1.35 million wood homes built every year in the United States. On average, 15,000 board feet of lumber is used in the construction of a single house.

"Let's do it," he says, his languid baritone laced with the musical drawl of a Virginia boyhood. "Let's knock this house out."

"Mr. Reade?" hollers Nathan Miller as he balances atop the steel foundation beam 10 feet above the basement floor. The name, as always, isn't said as a declaration but as a question.

"Mr. Reade?" yells Drew Poling.

"Mr. Reade?" cries Nick Gauder.

For the master framer, school is in session. Every work day for the last six years, Robert Reade has taught novice carpenters how to grasp a hammer, read a blueprint, snap a line, toenail a stud, sight the crown of a board. He leads one of 10 home-building industry programs aimed at upgrading the sorry state of house framing in the United States. The Industry Education Alliance launched the efforts after a Home Builders Institute study revealed that two of three builders felt forced to hire poorly skilled framers.

"When I frame a house, I feel a pace," Reade says, as he watches his crew lay out power saws and generators and 2x4s for the day's work. Before taking on the challenge of teaching young framers, Reade was building custom furniture and cabinetry. But he missed climbing acrobatically on the rafter-ribbing of a house. In his younger days, that always made him feel like an athlete, kept his senses sharp. The hammering made him feel not tired but robust. And calculating the roof rakes, square corners and rafter angles kept his brain humming.

"I can tell you something. There is nothing nicer-looking than a stick-built roof just sitting up there against the sky with no sheathing on it yet. It's a work of art. It's sad to cover it. When I see it, I feel what a potter must feel when he makes a pot, what a writer must feel when he writes a line. And now that I'm into the far half of my life, I want to pass that feeling on to these kids, to see their eyes turn bright." He laughs and runs an open hand through a full beard. "You know, every time I finish a house, I stop and wonder to myself: Where does the space that new house occupies go? Is it lost, or has it moved someplace else? What happens to it?"

Then, once again, the reprise: "Mr. Reade?"

The steel beam that runs the width of the house doesn't fit into its foundation pocket, and Nathan Miller says it's too long. Reade eyeballs it. "It's the angle, not the length." He grabs a circular saw and trims out a bite of the foundation's wooden sill board, the beam falls into place. All day, he is engaged in a kind of carpenter's Socratic dialogue.

Teacher: "How far is the fireplace cantilevered off the house?"

Student: "Two feet." Pause. "Ah, three feet?"

Teacher: "Let's go look at the plans." It's two feet.

Student: "I got to thinkin' too much."

Teacher: "Does this two-by-eight have a crown in it?"

Student: "I can't see it."

Teacher: "All right, everybody come look at this board."

Reade, a short, muscular man whose face is worn from the years of wind and rain and sun, lights a cigarette, tilts his head and blows smoke off into the pale blue sky. "Now this is where the craftsmanship comes in." And for 10 minutes he talks of boards and wood and trees. "A board is not a dead tree. It's like the caterpillar and the butterfly. It's at a different stage in its life." As he talks, one end of the 2x8 rests on the ground, edge up, the other end rests on his left shoulder, his left arm looped up and hooking the board's top edge at his wrist.

Reade examines blueprints with his apprentice framers—from left, Lamar Thomas, Steve LaRosa and Bill Lane. During the last 25 years, the average size of an American family has declined from 3.6 to 3 people, but the average floor space of a house has increased from 1,600 to 2,100 square feet.

"See this grain," he says, stroking the gently sloping, elongated fibers with his fingertips. "It's talking to you." When it's right and twirling, watch out. Saw that board and she'll cut loose like a taut spring, corkscrewing the wood. Always study the tip of a board. If the grain curves sharply, the board will likely cup—curve upward slightly at its edges—along its face against the direction of the tip's grain. When the grain on the face side rises uniformly, the board will likely crown—rise slightly—on its long edge with the grain's upward sweep.

Perched on the ceiling joists of a house in Columbus, Reade admires the precision workmanship in the hand-cut 2x12 rafters. "This is called rough carpentry, but that's just a designation. There's nothing rough about it."

But the rules of crowning and cupping differ with a board's use. Floor joists are always laid on their edges with the crown facing up, because they then make firmer contact with the flooring and resist sagging better. But 2x4s nailed face-to-face and used as vertical king and jack studs to support headers over windows and doors should always have their crowns facing opposite directions so they cancel each other out and create flat outside edges for nailing drywall and window trim. And the 2x6s or 2x8s that run flat atop the foundation should always lay with their crown edges facing into the house. That way, a sill board's crown never protrudes past the house perimeter to create a bulge in the wall.

"All right," Reade says to Nick Gauder, "look down the top edge of this board." Gauder takes the board, holds one end to his eye and sights Kentucky-rifle-style down the edge toward the end resting on the ground. "See the crown?" Reade asks. Gauder is upset. He can't see it. "Don't worry," Reade says. He takes his stringline and puts its end at the upper left-hand corner of the board's face. He has Gauder hold it in place, then runs the line along the board's face to its opposite upper corner. When he does this, an infinitesimal rise in the board's edge appears above the string.

"Now look down that string," Reade says. "See the crown?"

"Yeah!" Gauder says, all excited.

The men spread around the job—nailing and stacking window and door headers, sawing joists to length, laying out loose joists from center beam to outside walls, calculating the distance from the outside wall to the center of the fireplace, figuring the 45-degree-angle cuts for the corners of the bay window. Hammers are clattering, a portable generator is yammering, and the scent of fresh sawdust, an oddly sweet smell, hangs above the power saw. Reade and his men have already checked to see that the foundation is level. They've also determined that the foundation is about a half-inch shy of its planned width. To accommodate this, they have extended—floated is the framer's term of art—the sill plate boards, which must be flat and square, a quarter inch off each edge of the foundation. When the house is sided, the float won't be noticeable. It's only dangerous structurally if it extends more than an inch.

Although these beginning steps look simple, they are the most important in framing a house. "Everything after that just hangs on the frame," Reade says. But if the foundation isn't level, if the sill isn't square, if the joists aren't properly placed in relation to the plumbing, if the stud, door and window layouts aren't correctly pulled from the blueprints and marked on the sill, troubles rise to the roof.

Reade stops to show a man how to ensure a straight power-saw cut by eyeing over the saw's blade, not its body. He stops to tell a man who has cut 11 feet of joist from a 16-foot board that he should have used a 12 footer, which would have left only one foot of waste. He stops to show two men carrying one 4x8 sheet of plywood how to hoist the sheet against the outside of a left shoulder, grasp the wood at the bottom with a left hand turned backward and balance it at the top with a right hand held across the chest. He stops to tell a man that he has cut a standard joist out of a piece of southern yellow pine that was supposed to support the bay window. "Don't be embarrassed," he says. "This is how we learn. But once you learn, don't ever do it wrong again. Even when nobody's looking."

Every man on every Reade crew must come to understand every detail as a piece of the frame. "If you can't visualize the

completed project," he says, "how in the world can you build it?" He tells his crew: "When I build something, it's the second time I've seen it. The first time was up here." He touches his forehead. "It's not only the painter or the sculptor who has to visualize the finished object. It's the woodworker too. Yes, there is technique you need to know to use your tools." You must learn that a cat's paw won't crack wood if you run the paw with the grain, that a keel sheath with its thick crayon inside is needed to mark layouts distinctly, that a hammer must be gripped tight and loose at once, like a golf club, and that it should fall from the peak of its arc of its own weight, like a pendulum. Knowledge matters.

"But there's also an attitude you need to do fine work," Reade says. "It's an artistic attitude." When a member of his crew can't envision how a double 2x6 header supports a window, Reade asks him to recall how the window trim looks inside a finished house, how the window looks in the wall, and then how the wall looks beneath the ceiling and above the floor. Reade trains him to see the entire house and the place that window header occupies, its niche. "How does it connect to everything else?" he asks.

Reade learned to think that way long ago. When he was 8, his dad—a navy officer, mathematician and amateur woodworker—built a small step stool for him so he could reach the controls of the table saw. "I can't remember not knowing how to run a table saw," Reade says. He and his dad built cabinets and chairs and a cedar chest Reade still keeps in his study. He once asked his father if he should fix a carpentry mistake he had made that was hidden from view. "You know it's there," his father said. Young Reade felt ashamed, and he fixed it.

At 14, he took a summer job doing scut work for a builder, who soon assigned him to work with an old carpenter, a Pennsylvania Dutchman named Orville Walters. The man taught him to change the blade of a power saw by propping the saw between his legs to keep both hands free. He taught him to pound a rectangular cut nail into the foundation sill board with the nail's long face running with the grain so it wouldn't split the wood. He taught him a million tricks. And he told him: "Son, if you're gonna do this your whole life, swing a wooden-handled hammer. Nothing absorbs the shock to your arm like wood."

Reade went to Penn State, majored in economics and became an elementary school teacher. But he soon realized he enjoyed his summer carpentry work more. Over the next 25 years, he went from framing houses to building custom cabinets to making tables, desks and dressers. Then, arming himself once again with a Hart 25-ounce framer—a hammer with a long, elegantly curved wooden handle—he rediscovered the rush of adrenaline that made him take up carpentry in the first place.

"It's addictive. You don't want to stop for lunch. It just feels so good. It comes from feelings of pride, but that's not all of it. It's emotional, almost spiritual. It's my connection to the cosmos." He laughs. "Maybe it comes from where that space goes that I'm taking up to build this house. Anyway, with this job, I can pass on that feeling, jump start some people." Then, like a preacher calculating his conversions, he says, "Not all of 'em, but some of 'em."

Teacher: "How do you change decimals to fractions of an inch?"

Student: "You multiply by sixteen."

Teacher: "How long is the hypotenuse of the bay's forty-five-degree triangle?"

Student: "Ahhh..."

Teacher: "Square both sides, add them together and take the square root of that number to give you the length of the hypotenuse—thirty three and fifteen sixteenths, right?"

Student: "Ah, right."

By quitting time, the men have something to show for their work. They've "rolled the joists"—laid them out face up from foundation to center beam and then, starting at one side of the house and stepping backward, one foot on the steel beam, another foot on the flat joist behind them, they have lifted and lapped the house's intersecting joists and nailed them in place. They've framed the fireplace and the bay window. Tomorrow, they'll lay the first floor sheathing, gluing it to the joists and making sure to nail it down tight before the goop has had time to set. In the basement, they'll remove the nails that are bent like spider legs from the sill board down over the center beam. That way the nails won't squeak when people walk on the floor. They'll build the walls flat on the first floor, pulling the stud and door and window marks off the sill board. Then they'll raise them, square the corners with plywood sheets and march up the house, building stud on top of stud, rolling the joists on the second floor. Finally, they'll move into the roof rafters, with their angled cuts, compound joints and the constant danger of falling. "That's where you separate the men from the boys," Reade says. "Climbing around up there, it's got juice."

"All right," he hollers, "let's get cleaned up."

The young men scamper around, picking up trash and remnants of wood, putting away tools. They have the energy of puppies. More than anything, what the old dog wants to teach them—besides a million tricks—is shame. He wants them to feel ashamed when they miss a cut by an eighth of an inch, deface a stud with hammer scars or hide a shim under a joist. He wants to imbue them with a craftsman's conscience. Work well even when no one's looking.

Smoke in hand, Mr. Reade heads back to the van, steps over the tire track that has dried in the day's sun and unbuckles his tool belt, which falls around his rump as he lifts, swings, and lays the whole clanking contraption—with tape and stringline, cat's paw, keel and hammer—open like a saddlebag over his left shoulder. "Every morning when I put on my tool belt," he says, "I tell myself that I am the best carpenter east of the Mississippi. Now, that's a cocky thing to say. But it pumps me up and sets the day's standard." He flicks his Camel, blows the last.

"That's what I want for these men."

Other golfers may fudge on their scorecards, but Reade—who plays 36 holes a week—considers it a matter of honor to uphold the "integrity" of the game. Likewise, some framers may rely on finish carpenters to cover up their mistakes, but not Reade. "There's an expression about imperfection. Can't see it from a galloping horse. I don't want that attitude."

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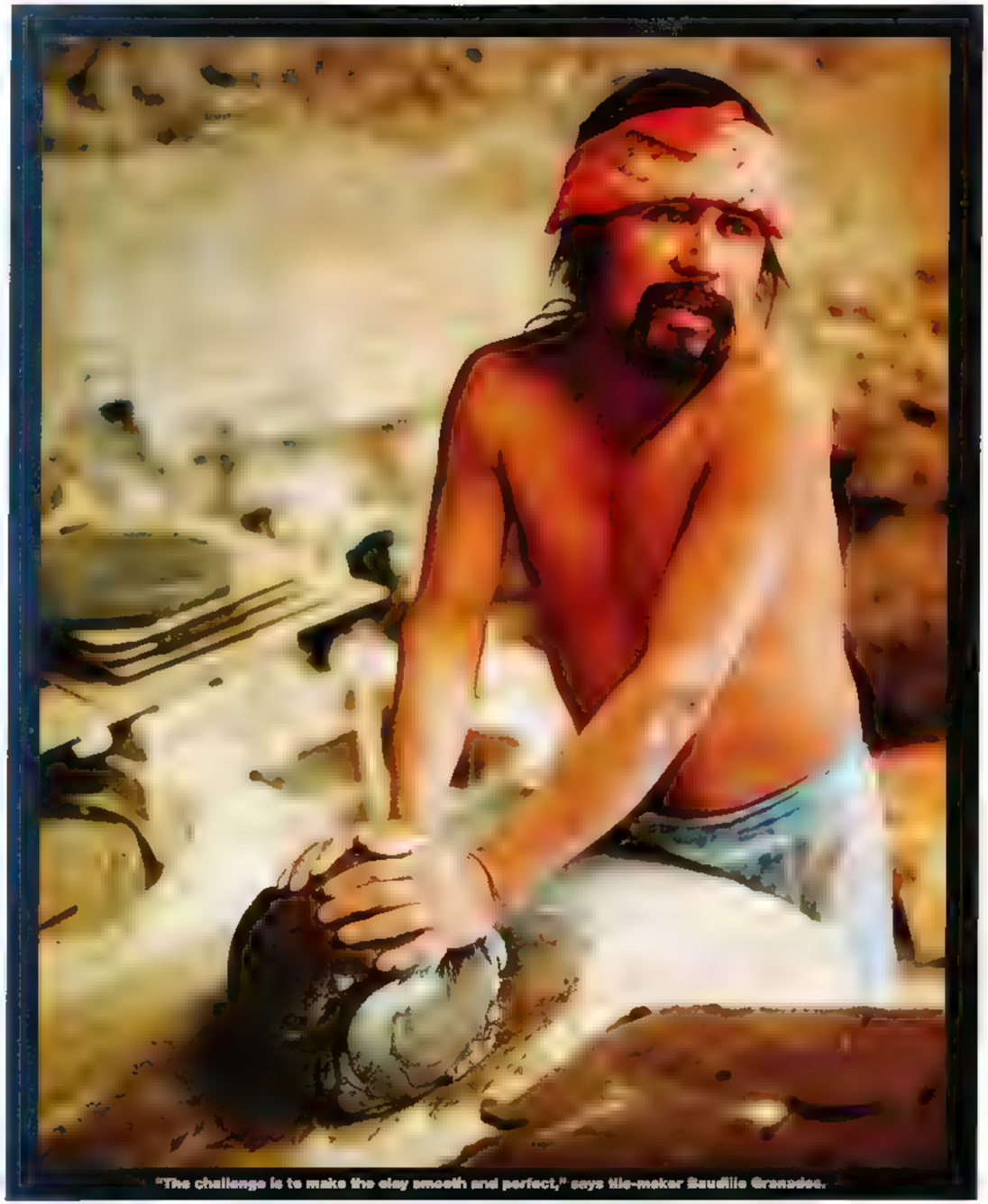
mexican tile

Eduardo Sierra lifts the hunk of clay above his head with both hands, drops it on the counter and, without pausing, gouges his fingers into the grayish-brown mound as a fine powder billows upward in a plume. After massaging the clay into pliability, he throws on a handful of silica dust and flattens the softened mass into a rectangular pancake with

RON ARIAS PHOTOGRAPHS BY DAN BORRIS



"The challenge is to make the clay smooth and perfect," says tile-maker Saudilio Granados.

Fortino Ramirez filters mud that workers will knead with their bare feet and turn into malleable clay.

a steel roller. He then uses a cutter to divide the clay into a dozen or so four-by four-inch tiles that will later be fired, glazed and painted by hand.

With each squeeze of his hands, each dash of dust, each roll of the pin and each swipe of the cutter, Sierra reveals his confidence and grace. After nearly 30 years of pounding, kneading, smoothing and shaping clay to make tiles, the short, barrel-chested artisan works at a quick and rhythmic pace, occasionally flashing a satisfied smile at his efforts. "Making tiles without machines," he says with pride, "is a costly art. It requires a lot of affection, even more than you would give a baby."

Sierra, a 58-year-old grandfather of five, lives and works in Dolores Hidalgo, Mexico. Sheltered in the lee of a small, arid mountain range about 600 highway miles south of the Texas border, Dolores Hidalgo is the Mexican "cradle of independence." Here in 1810, Father Miguel Hidalgo y Costilla sparked the revolution against Spanish rule. Father Hidalgo also introduced the art of tile-making to Dolores Hidalgo, and it remains the city's pride and joy. Each brittle, fragile and slightly bowed tile possesses a texture that can only be achieved by human touch. That includes large terra-cotta flooring tiles, like the ones Jim and Colleen Meigs laid down in the courtyard of the *This Old House* project house in Tucson, as well as decorative ceramic tiles used to adorn kitchens, walls and stairway risers.

As their hands work the clay, the tile-makers of Dolores Hidalgo connect with an aesthetic tradition nearly as old as civilization itself. Ancient Egyptians, Persians, Greeks and Romans all made ceramic and terra-cotta tiles. The Moors spread the craft into the Iberian Peninsula, and the Spaniards and Portuguese took it to the New World. Dolores Hidalgo, blessed with clay-rich alluvial dirt from the Sierra de Guanajuato foothills west of the city, inherited a blend of colors and designs called Talavera, after the predominant style of the medieval ceramic center in Talavera de la Reina, Spain.

The Talavera influence is evident throughout Dolores Hidalgo. Shiny tiles of flowery blue-and-white designs cover the base of the bandstand gazebo at one corner of the plaza in the center of the city. Multicolored rows of tiles brighten the doorways, windows and walls of flat-roofed adobe homes and shops. And a peek into just about any open doorway invariably reveals a courtyard, corridor or stairway splashed with earth-toned browns, yellows, blues, greens and rust-reds.

Like many of the 70,000 residents of Dolores Hidalgo, Sierra is a mestizo, of European and Indian blood. His ancestral ties to the city run deep. "My father worked in dirt as a farmer," he says. "So did my grandfather and his father before that. I don't cultivate corn, but I do my part in creating beauty from the earth." Six days a week, Sierra rises before dawn and, to the accompaniment of crowing roosters and barking dogs, walks along an unpaved and mostly deserted road to the Manzano tile factory, leaving a small cloud of dust in his wake. Dolores Hidalgo is cool and windless in the early morning, and Sierra finds it the best time to work, before the withering afternoon heat sets in.

Maguey cactus spikes, spindly eucalyptus trees and a tangle of skeletal mesquite branches mark the factory boundary, which borders fields planted with corn, alfalfa, barley and beans. Next to two large adobe-walled warehouses with corrugated roofs, chickens poke about a corral. Out back, another worker mixes dirt and water in a cement cistern, the first step in the process of turning earth into tile. Wearing only a pair of shorts, he stomps around in watery goo that comes up to his waist. The mud slurry oozes out holes near the bottom of the cistern and into long, flat drying beds.

Entering a small shed attached to one warehouse, Sierra clicks on an overhead lightbulb and moves to a corner table, where he will roll out and cut more than 2,000 four-inch clay squares during the next eight hours. He is paid by the piece and usually earns about nine dollars a day. He has no house payments to make on the modest adobe home where he lives with his wife and several other members of their extended family. Nor does he own any modern appliances or a car. But a gallon of milk costs $1.80, a dozen eggs 80 cents, a pair of work pants about $16. "It's difficult these days, but somehow we manage to get by," he says.

By mid-morning, two of Sierra's grandchildren, free from school because of a holiday, help bring more clay into the shed. Seven-year-old Irma and 10-year-old Anselmo struggle with a mound balanced precariously in a battered wheelbarrow. They dump the clay onto the floor and cover it with pieces of broken brick to suck out the moisture. "That's how I learned, doing what they're doing," Sierra says.

Outside, in an open area the size of a basketball court, hundreds of one-foot-square floor tiles an inch thick stretch out in rows. After days of hardening in the sun, the tiles are baked for six or more hours in two van-size gas-fired kilns, the factory's only concession to modern technology. Next to the kilns, a makeshift canopy shades an area where half a dozen teenage boys sort through hundreds of fired and finished tiles, tossing out the cracked, broken and blemished pieces.

In the distance a donkey brays and, from the barnlike areas where several dozen people are hard at work, radios beckon with brassy mariachi music, the thumping whirl of a Colombian *cumbia* and the excited play-by-play calls of a soccer match. Against a wall in one warehouse, young women with small, pointy-tipped brushes sit on low stools, painting hand-size tiles that have already been baked once and brushed with glaze on their smoother top side. Although the women follow several established designs for flowers, birds and sunbursts, no two tiles turn out exactly alike. The length of lines, the thickness of the paint, a tiny, inadvertent squiggle—all contribute to the uniqueness of each tile.

At his work table, Sierra continues to lay down one freshly formed square after another. Each is as fragile as a damp slice of toast. He knows that when he runs a finger over a fired and finished ceramic tile, he should feel the tiny bumps and undulations on the glazed surface as if it were polished glass made the old handblown way. When he wets the rough, unglazed underside, he should smell the cool, chalky whiff of moist broken brick. With each tile, Sierra and his fellow artisans transform a hunk of dirt into an object with warmth and personality. "We touch what we make," he says. "There are no machines here. It's all earth and water, sweat and heat."

Ismel Alvarez Ramirez, age 9, helps lay out moist tiles under a skylight, where they dry for four days.

OPPOSITE PAGE: After stacking dried squares in a brick oven, Juan Rodriguez will fire them for 16 hours at 1,600 degrees F.

Patricia Rodriguez Valadez uses a wood template when brushing the first layer of paint on ceramic ti

OPPOSITE PAGE: Indoors or out, decorative tiles create a sense of vibrant earthiness and timeless beauty in Dolores Hidalgo

The fragility of ceramic tiles—which crack, chip and flake easily—is part of their charm.
OPPOSITE PAGE: Since the Spanish colonial era, wealthy families in Mexico have brightened their kitchens with Talavera-style tiles.

For details and sources see **Directory** on page 133

A New England Wonder

300 years and 3 acres of defiance

BY BRAD LEMLEY PHOTOGRAPHS BY THIBAULT JEANSON

Proud and stern, this clapboarded Calvinist stands resolute on its fieldstone foundation, ringed by a green jumble of hemlock and Norway spruce. Latter-day remodelers have grafted no fewer than six additions onto its sides and back. But the facade, black shuttered and fastidiously symmetrical, still looks much as it did in the early 1700s, when John Crehore notched and pegged his timber-frame farmhouse.

Like an adobe Pueblo Revival in Tucson or an Arts and Crafts bungalow in Seattle, our 1997 dream house project in Milton, Massachusetts, is the quintessence of its place—a classic choice for *This Old House*'s 19th television season. "It's very much a New England Colonial home, a wonderful form," says producer Bruce Irving.

Because no Yankee can resist the urge to tinker, an 1880s addition sprouts from the original structure, and a greenhouse, enclosed mudroom, laundry room and home office meander off it as well. The haphazard layout presents design challenges, such as a kitchen that huddles in a dark corner and a boxy, graceless laundry room tacked on the north wall. But the house is structurally sound. "It's great," says Norm Abram. "I'm looking forward to getting sawdust in my hair on this job."

A Rural Relic

A barn inside Route 128, the beltway that rings greater Boston, is a defiant anachronism. As real estate prices ratcheted skyward through the 20th century, old farm lots were sliced and diced and barns dismantled. But this 2.9-acre parcel remained intact, and so did its three-story red-shingled barn, right down to the cattle troughs and chicken runs.

Built about 120 years ago, partially of recycled timbers, the barn is generally solid. But it is not one of those tabled agricultural cathedrals with beam joinery that won't admit a playing card. The traditional sliding door has been swapped for an inappropriate pair of suburban garage doors. Cow stalls, still bearing the hand-painted designations "Alice" and "Alice Junior," grace the south wall.

Extending from the south side is the property's only hopeless structure, a decrepit ell. With its swaybacked roof and walls coated with graffiti, it has become a storehouse for domestic detritus. "It's toast. Has to go," Bruce says.

But the barn's soaring interior, some 30 feet high at the peak and pierced by shafts of dusty sunlight, is enchanted territory. "We'll respect the barn as a barn," promises director Russ Morash. "We'll fix it cosmetically and structurally—nothing fancy."

This Old House Could Be Yours

Through the years, *This Old House* viewers have grown accustomed to identifying—and, often, sympathizing—with the homeowners who offer up their residences as TV projects. But WGBH, the Boston public television station that produces the show, bought the Milton house outright. Norm Abram, Tom Silva and contractors hired by *This Old House* will revamp it and sell it on the open market, possibly via public auction.

The decision to give up the house was wrenching for the most recent owner, Virginia Devine, who, with her late husband, Donald, took up residence here in July of 1958. "I cried after the offer was made," she says. Her four kids, all grown and gone, "didn't want me to sell it. It's the only home they've ever known." The barn is especially freighted with family memories. "We would have birthday parties out there. I made Batman capes for the boys, and they would swing off the loft... They just had the best time." She believes the capacious barn and open land for roaming "made my kids more adventurous than most. To this day, they are all willing to strap on a backpack and head off anywhere at a moment's notice."

But Donald, a psychiatrist who used the converted woodshed as a waiting room for patients, died six years ago. "It's too much house for a widow," Devine says. And if it has to go, "I'm thrilled that *This Old House* is going to take care of it."

The decision to buy the house—for $415,000—was a so stressful for director Russ Morash, but the sensation wasn't entirely new. When the show began in 1979, it was a renovate-on-spec operation, with the attendant potential for calamity.

"In Dorchester, we bought an old, neglected Victorian that might have been torn down had we not saved it," Russ recalls. "It cost about $12,000 to buy and another $30,000 to fix up. It was easy to sell it and make our costs back.

"That armed us with a sense of purpose and optimism, so we undertook a massive project the next year, converting a complex of buildings and a barn into five condominium units. But we smacked right into a recession and lost money on the sale. It was sobering, to say the least. From then on, we thought we would look for people who already owned a house that we could work with."

And so it has gone for 17 successful years. The projects have accumulated, as well as the knowledge of the core team. Russ, Bruce, Norm, host Steve Thomas, contractor Tom Silva and plumbing and heating expert Richard Trethewey.

"People wonder, 'What would the guys do if it was their house?' This will give us a chance to provide an answer," Bruce says. The Milton renovation will focus largely on "surface things: cabinetry, wallpaper, paint, even furniture and upholstery," he says. "All that usually gets compressed into the last ten minutes of the last show, but these are things people really want to know about. I just bought a house myself, and I want to know."

The guys plan to bring the kitchen from the dark rear of the house to the sunlit east side, displacing the greenhouse. The kitchen's former space will house a media room—perhaps the gloom there will augment video clarity. "We've wanted to do a media room for years, but none of the homeowners have wanted one," says Russ. The team also looks forward to installing a state-of-the-art exercise room in the barn, and a Norm-designed workshop in a new building erected on the footprint of the demolished barn ell.

And they anticipate, as the season progresses, showing viewers how to stanch cost overruns. Russ says previous project homeowners, boggled by instant television stardom, plaster dust and glossy brochures, have tended to say, "What the hell" too frequently and approve unnecessary flourishes that make costs skyrocket. The show has budgeted $300,000 for this renovation, which—considering that it includes refurbishing a large house and barn and building a sizable new ell—is far from generous. "It will be great to have a chance to be more creative in how we stick to the budget," Norm says.

The result, says Steve, will be the "ultimate cocooners' house. You'll be able to work out, have an office, garden, tinker in the workshop, relax in a killer media room, build your boat in the barn. You'll never have to leave."

"For once, we'll have a chance to leave more than our goodwill behind," says Russ. "I hope we can make it so wonderful that I want to own it myself."

Jeff Devine, youngest of the former owner's four kids, wed Sharon Moran last spring under this Norway spruce in front of the house.

When the barn's dilapidated ell (above) is demolished, Norm and Tom will salvage the three-sectioned arched window (below) for a new workshop.

For details and sources see **Directory** on page 135

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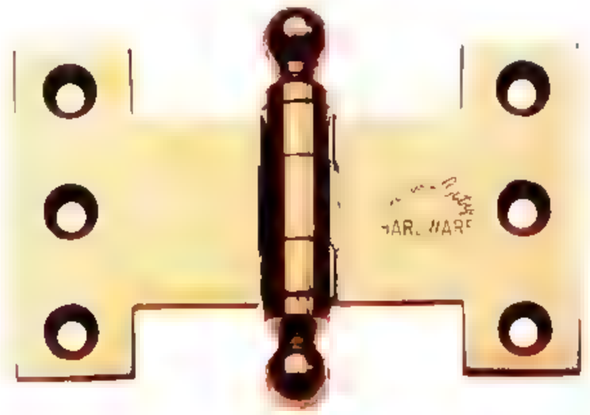


H I N G E S

We hide hinges. We cannot open doors or windows without them, or close a car trunk or get out of bed (human movement is impossible without the ligament hinges that hang our skeletons together). Still, we prefer to ignore them. We hate the sound of a squeaking hinge but rarely bother to disassemble and lubricate it. No matter how fine and polished the brass, or how complex the movement, or how ingenious the design, we never stare. We don't wonder much about the blacksmith who made it, the engineer who perfected it, the carpenter who hung it just so. All that is an affliction of our times. A hundred years ago, hinges were a near art form—painstakingly cast in foundries, handwrought, intricately carved and laid out boldly on doors and jewelry box lids for all to appreciate. Ours is a practical age in which the functionality of a hinge on a submarine hatch is its only importance, in which reducing the cost per hinge through efficient manufacturing processes is more important than finish or beauty. In such an age we are better off, every so often, to stop and admire the miraculous ordinariness of the hinges that swing our world.

BY GEORGE NASH PHOTOGRAPHS BY GARY HUSH

FOUR CENTURIES OF SWING

door hinges

1. COMMON BUTT
Standard 5-knuckle loose-pin for use with exterior doors. Stainless-steel type shown is resistant to corrosion; also made of solid brass, chrome-plated brass, bronze, enamel-primed steel and plated bright steel.

2. BALL-BEARING BUTT
Used with extra-heavy doors up to 600 pounds. Two or more sealed bearings between the knuckles resist wear, add strength and ease movement.

3. RISING BUTT
Diagonal split in barrel lifts door over uneven floor or carpet as it opens; also creates self-closing action.

4. CAST IRON BUTT
Reproduction of the most widely used interior door hinge of the early to mid-19th century. Pin fixed in the barrel of the jamb leaf allows the door to be lifted off.

5. VICTORIAN-STYLE BUTT
One of many faithful reproductions of mid- to late-19th-century patterns. Usually made of cast or extruded brass or bronze.

6. ADJUSTABLE SPRING
Heavy-duty, self-closing, for doors weighing up to 160 pounds. Speed of swing controlled by adjusting spring tension with supplied Allen wrench.

7. DOUBLE-ACTING SPRING
Allows single or double doors to swing open in either direction and automatically return to closed position.

8. CONCEALED
Barrels recessed into edge of door and jamb; knuckles that fold into barrels make hinge invisible when door is closed. Range of sizes for use on doors up to 500 pounds, small furniture doors and folding wall panels.

9. PIVOT
Semi-concealed leaves rotate around pin and mortise into top and bottom of door; typically used with hydraulic closers. Range of sizes for doors up to 600 pounds, cabinets and furniture.

10. OLIVE PIVOT
Decorative forged steel or brass for light to heavy doors; furniture and casement windows, wide-throw action swings door clear of thick casings or wide jambs.

11. UTILITY STRAP
Available in a wide range of sizes for barn and shed doors, farm and garden gates, work chests, etc. Plated finish has only limited rust-resistance, hot-dipped zinc, stainless steel, brass, matte-black enamel available for better protection and appearance.

12. STRAP WITH PINTLE
Heavy-duty wrought-iron reproduction of traditional Colonial style for board doors, gates, heavy chest lids. Barrel of the long strap (up to 28") slips over the stout pintle screwed into the frame or gatepost.

cabinet hinges

13 and 14. BUTTERFLY
Reproductions of surface-mounted hinge dating back to 16th-century England and widely used on early American furniture and cabinetry. Iron version traditionally fastened with handwrought nails driven through red leather washers; brass version dates to late 18th century.

15. H-L
Reproduction of traditional cabinet, furniture and door hinge widely used throughout Colonial America. Available in faux forged, antiqued or hammered finishes and hand-forged wrought iron.

16. STRAP
Reproduction of rustic Colonial style for cabinets, trunks and light board-and-batten interior doors.

17. SPRING
Light-duty, surface-mounted brass. Similar to larger screen-door hinge, for self-closing cabinet doors.

18. NON-MORTISE
Nested leaves require no mortising; large leaf screws to cabinet edge, small leaf to cabinet door.

19. PIVOT
Attaches to cabinet stile and top and bottom edges of door with no mortising; slotted screw holes allow up-and-down and side-to-side adjustments.

20. OFFSET
Wide leaf stepped to fit lipped doors, narrow leaf mounts on face of cabinet stile. Available in many finishes and styles. Usually spring-loaded for self-closing action.

21. CONCEALED CUP
Fully concealed and self-closing for frameless "Euro-style" cabinets. Cup fits into 35mm (1⅜") circular mortise in back of door; base plate screws to inside wall of cabinet; set screws in arm allow three-way adjustment of door. Available in many styles to suit various door designs and swing requirements from 100 to 270 degrees.

22. CONCEALED SURFACE-MOUNT
Similar to concealed cup hinge, self-closing non-mortise style screws to back of cabinet door and cabinet sidewall.

furniture hinges

23 and 24. RATTAIL
Reproduction of hand-forged traditional hinge used for armoire doors and blanket chest lids. The leaf mounts on the face of the door; the tip of the rattail fastens to the frame or jamb with the threaded bolt and nut shown; offset types available for lipped doors.

25. ICEBOX
Reproduction of ornate offset hinge used on antique iceboxes. Used for restoration or for decorative hardware with lipped cabinet or furniture doors.

26. FLUSH
Fancy-patterned wrought brass surface-mounted strap hinge suitable for an ornate trunk lid or heavy cabinet door.

27. STRAP
Made of cast brass, one of many reproduction types for chest and trunk lids. Special supports usually needed to prevent damage from the lid swinging too far back.

28. ADJUSTABLE SPRING
Surface-mounted, adjustable spring-tensioned self-closing hinge. Solid cast brass for fine furniture and cabinetry.

29. NON MORTISE
Provincial-style brass, for tall, narrow furniture doors. Lower leaf swings under upper leaf as door closes; for a tighter fit, one or both leaves can be mortised.

30. BROAD
Relatively wide leaves of this small fixed-pin butt hinge provide extra support for lids and flaps, usually mortised into the surface.

31. PIANO
For full-length support of chest lids and furniture flaps. Available in lengths up to 6', in solid brass, steel and stainless steel.

32. DROP LEAF
Double-jointed variety of backflap hinge for drop-leaf tables with a ruled (beveled) joint; mortises into table and flap, leaving no visible gap between the two. Also available as a spring-loaded hinge for flaps that swing up and self-lock in horizontal or vertical positions.

33. NARROW FLAP
Small, double-jointed, full mortised, for lid of secretary desk; nothing protrudes above surface when flap is opened.

34. QUADRANT
Built-in stop at 100 degrees holds humidor, small chest and other lids open without additional hardware.

35. JEWELRY BOX
Opens to 90 degrees, remains concealed when lid is open. Narrow flap is mortised into back edge of lid, wide flap into backside of box.

36. WOODEN BUTT
Hardwood leaves joined by a brass pin, supplied undrilled for custom mounting.

37. BARREL
Fully concealed barrels mortise into cabinet and door edges, set screw actuates cams that lock barrels in place. Swings 180 degrees. Barrel diameters from 2mm to 50mm (1/16" to 2") for jewelry boxes to heavy doors.

38. CLAMPING GLASS-DOOR
Set screw secures the glass panel in a cushioned slot; leaf mounts on the side of cabinet, 180-degree swing.

39. DRILLED GLASS-DOOR
Cylindrical brass plug fastens to glass panel through a 19mm hole drilled through glass, 105-degree swing.

40. DOUBLE-ACTION
Double leaves and barrels allow doors to swing either direction. For folding screens, bifold doors, louvers, shutters. Door thickness must be equal to or greater than width of leaves.

window and shutter hinges

41 and 42. PARLIAMENT
Reproductions of old-fashioned wide throw hinge used with casement windows, French doors and other heavy loads. Pivot point beyond jamb allows door to lay flat against wall.

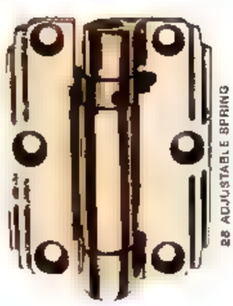
43. SHUTTER STRAP WITH PINTLE
Reproduction of 18th-century design. Strap fastens to shutter, pintle is hammered into hole bored into window frame; decorative holdbacks secure open shutter against wall.

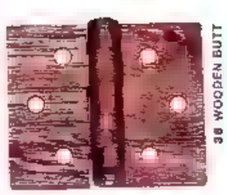
44. SHUTTER
Reproduction of common late-18th- and early-19th-century cast iron lift-off hinge for shutters and casement windows. Proper width is twice shutter thickness plus the casing reveal.

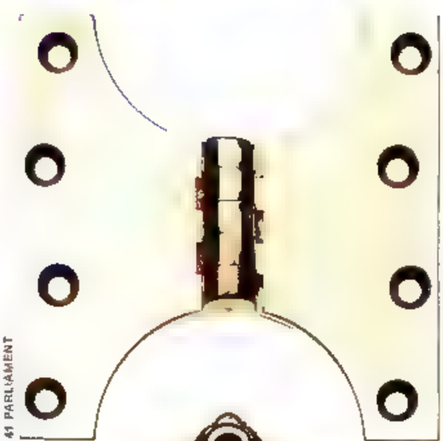
45. SELF-HOLDING SHUTTER
Reproduction of cast-iron hinge used throughout the 1860s. Lock-back design keeps wind from lifting shutter off hinge pins.

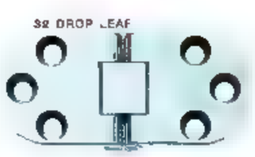
DETACH HERE

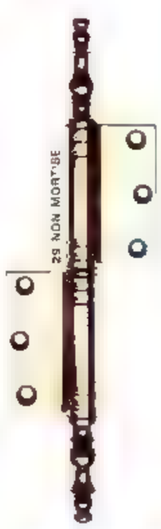
This Old House

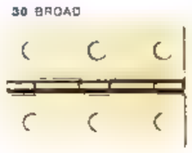


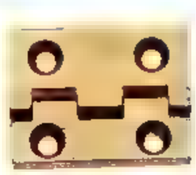


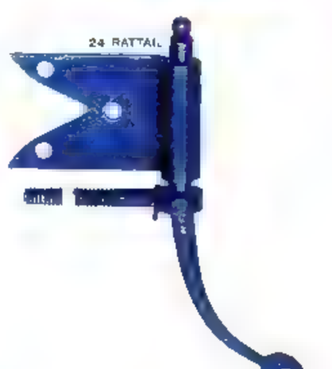


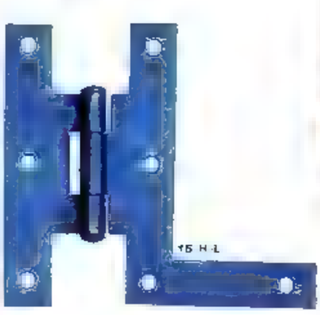


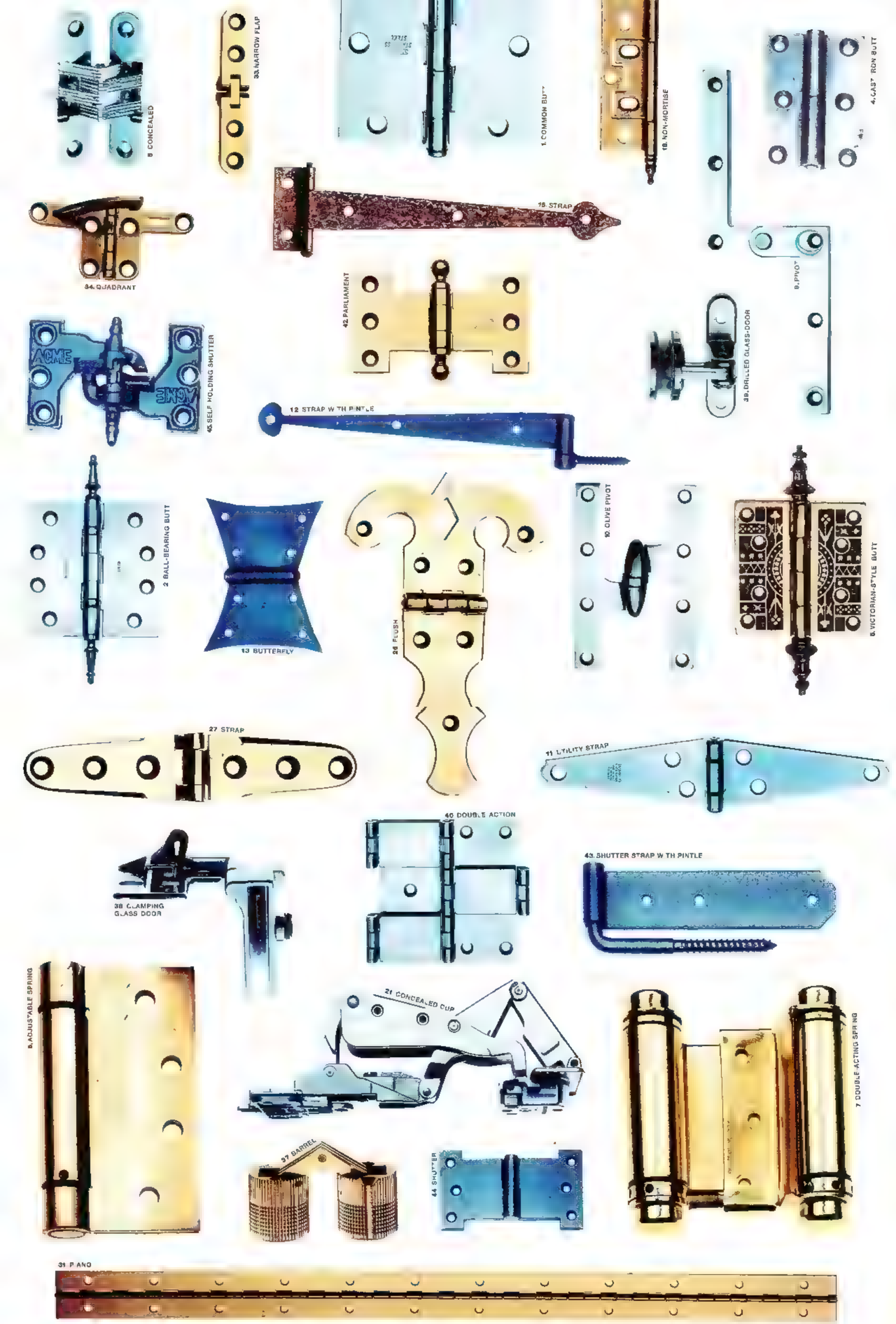












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Who Needs Rain?

Automatic sprinklers guarantee green

BY JEANNE HUBER PHOTOGRAPHS BY KELLER & KELLER

FOR YEARS, *This Old House* gardener Russ Morash found watering his lawn an aggravating chore. "It was a pain. You had to haul around heavy hoses and hook them to oscillating sprinklers. I was always getting called to the phone—and then I'd wake up in the middle of the night and remember that the sprinklers were still on."

Finally, last summer, Russ put in a lawn irrigation system that tends itself. The underground sprinklers switch on automatically when the soil is dry, pop up and deliver just the right amount of water, then click off and disappear until needed again. The system saves water because the sprinklers cycle on in the early morning when evaporation is less of a problem. And the lawn stays healthier because there's plenty of time for the grass blades to dry by nightfall.

Underground sprinklers were once a luxury for the rich, but that has changed. An estimated 10 million of the 65 million homes in the United States have automatic sprinklers, and the Irrigation Association, a nationwide trade group, estimates that 500,000 systems are added each year.

Planning a system is less daunting than it may first appear. Stores that sell parts often give away flyers with good step-by-step instructions. Some manufacturers offer free design services, and at least one company has a layout grid and detailed instructions on its Web site. One note of caution: Some published directions give short shrift to what needs to be done to prevent ice damage and to keep water in the sprinkler system from siphoning back into household water. Requirements for dealing with both of these problems vary by area, a parts-supply store or landscaper can provide more specifics.

The biggest decisions are how to group the sprinklers and what type of heads to use. "Put sprinklers that will be in the sun on one circuit, those in the shade on another," advises *This Old House* landscaper Roger Cook. That way sprinklers can be left on longer where more water is needed. Each circuit can contain only one type of sprinkler head. Bubblers, which deliver a softly flowing gurgle of water, work great for roses or other plants with foliage that shouldn't get wet. For lawns less than 15 feet across, the only choice is the basic sprayer, which waters in a fixed pattern. For large areas, impact heads or rotor heads work better. With a reach of 15 to 60 feet, they can often be placed just outside the lawn, easing installation and eliminating the danger of snapping off a sprinkler head with a lawn mower. Rotors—also called gear-drive heads—vary the throw of water, require less maintenance and spread more evenly than impact sprayers, which go pip, pip, pip as an arm rhythmically breaks up a jet of water. "The advantage of rotors is that all the parts are enclosed, so they stay free of grit and sand," says Mike Struhs of Rain Bird Sales of Azuza, California. "What a lot of people like about impact sprinklers, though, is the sound. If properly placed, there is no major difference in how evenly the two kinds spray."

Compared with how long Russ wished for automatic sprinklers, the installation itself was lightning-quick. Cook began digging the trench for the main pipe about 8 a.m., carefully shoveling the dirt onto burlap laid next to the lawn to keep the grass free of mud. Then he powered up a pipe-pulling machine and yanked the tubing into place across the main expanse of lawn. "Without the trencher, we'd still be digging," Cook said as he sat down to sip iced tea at 1:30 p.m.

Then he was back on his feet. Although he had not yet installed the sprinkler heads, he turned water on to one circuit at a time to flush out debris. "The biggest factor is dirt, but pebbles can be in there too," says Gary Capstick of Turf Products Corp. of Massachusetts, who helped with the job.

Cook attached the heads, checked the spray to make sure all areas were being watered evenly and shoveled soil back into the trench. By late afternoon, he was packing up his tools, and the yard was ready for entertaining.

But even the best sprinklers—and the most careful installations—are not foolproof. Last fall, a few weeks before Cook was to arrive with his air compressor to blow the pipes free of water, temperatures dipped into the 20s. That caused part of the backflow preventer to pop from its sheath, and it had to be replaced.

Those are minor annoyances, however. "Even though this lawn has the deepest and best soil on my property, it goes into decline if it's not watered regularly," Russ says. "We can't have that."

Set the sprinklers and sit back

Once a plan was set, it took just a few hours to get Russ's underground sprinklers into action. 1. Roger Cook tapped into a pipeline from Russ's well. On the black pipe leading up from the ground, he installed a valve that can be connected to an air compressor to blow the system free of water. Above that is a pressure vacuum breaker that local water officials require to prevent sprinkler water from siphoning back into the well. The device must be at least a foot higher than all sprinkler heads, so Cook put it next to other ugly utility services on a wall of Russ's workshop. 2. In a trench about 10 inches deep, Cook laid high-pressure (Schedule 40) PVC pipe leading to a round box that shelters valves for the sprinkler circuits. The pipe connections were easy—Cook just glued them together. He buried the box so its cover lies at ground level.

3. With a rented pipe-pulling machine, Cook put the rest of the irrigation lines into place. The machine sliced through the sod, leaving only a thin trail of loose dirt to show where the flexible tubing lay. Tubing is adequate for individual circuits, where water pressure is low, but rigid pipe must be used on the high-pressure line leading to the valves.

4. Cook connected the sprinklers with another type of flexible tubing instead of rigid risers, which are more likely to snap and harder to position precisely. He set each sprinkler so the top of the head was level with the surface of the soil. "If you set the heads up too high, the lawn mower comes across and eats them," he says.

Cook adjusts the arc of one sprinkler so that the spray reaches the heads of adjacent sprinklers. Head-to-head coverage helps ensure even watering.

For details and sources see **Directory** *on page 133*

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TIMELY TIPS AND USEFUL DISCOVERIES FOR GARDENERS

The banana slug can grow to 8 inches, making it second in size only to the 10-inch European ash black slug. Found in moist areas of the West Coast, the banana slug is the mascot for the University of California at Santa Cruz and has its own Santa Cruz-based Web site (www.slugs.com/slugweb/).

Loving the Enemy

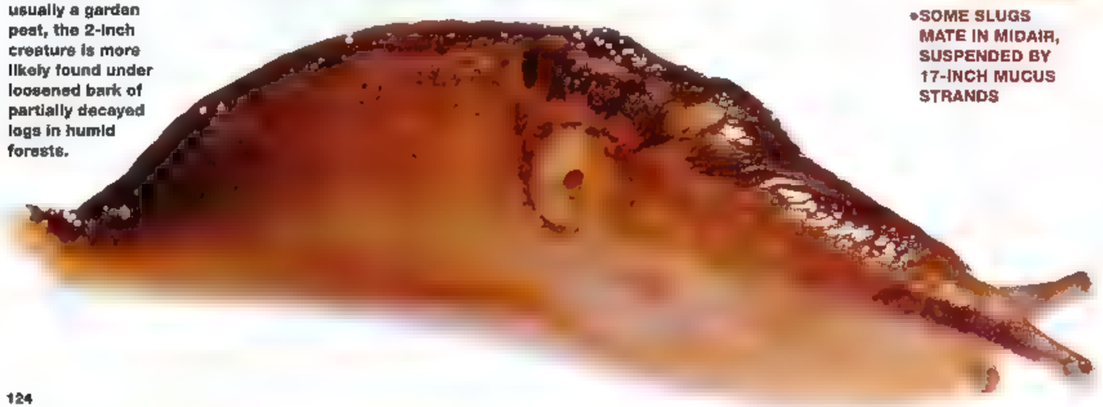
When humid, balmy nights bring hungry slugs out in force, otherwise gentle gardeners turn their thoughts to mass murder. Extermination tips involving blowtorches, hedgehogs or human hair are swapped like pie recipes. But slug lovers are mounting a counteroffensive.

"Don't judge a slug by what it does in your garden," says David Gordon, author of *The Field Guide to the Slug*. In the wild, he notes, this streamlined relative of the snail is one of nature's most important composters, devouring more than its weight in plant detritus each day. Although European imports wreak havoc on vegetable crops, native species generally do more good than harm. Banana slugs, repelled by the taste of sequoia seedlings, helped create California's redwood forests by devouring competing plants. And slugs may even save lives. The mucus that keeps the gastropods moist and helps them spread seeds and spores also provides University of Washington zoologist Ingrith Deyrup-Olsen with insight into human respiratory ailments such as cystic fibrosis. Her colleague, biochemist Pedro Verdugo, is using slug slime to develop a safer way of delivering cancer medicines to tumors.

Pierrino Moscarino, editor of *Invertebrata* magazine, considers slugs so useful that he won't put poisoned bait in his garden. Instead, he diverts the slugs to where they are needed. Each afternoon, he turns over wet planks scattered around his vegetable patch. "I pee off the slugs while they hide from the sun and put them in the compost bin."

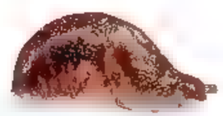
Is the pro-slug spin working? Perhaps. Moscarino, who is also a national supplier of invertebrates, says he has been getting "more orders than I can fill" for shipments of slugs—as pets.

Most East Coast slugs are descendants of stowaways that came from Europe in bulbs, but the Carolina mantleslug is a true native American. Not usually a garden pest, the 2-inch creature is more likely found under loosened bark of partially decayed logs in humid forests.



Slug statistics

- TOP SLUG SPEED: .025 MPH (2.2 FEET PER MINUTE)



- A SLUG'S TONGUE (CALLED A RADULA) HAS UP TO 27,000 TEETH

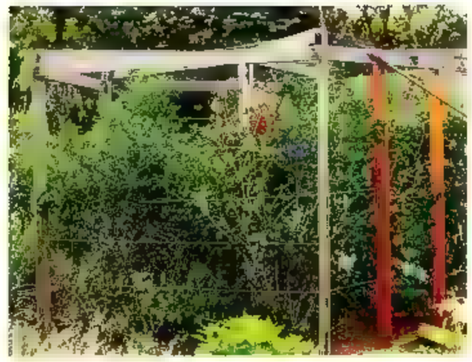
- A SLUG CAN DRAG 50 TIMES ITS OWN WEIGHT
- SLUGS ARE HERMAPHRODITIC

- SOME SLUGS MATE IN MIDAIR, SUSPENDED BY 17-INCH MUCUS STRANDS

SLUG PHOTOGRAPHS BY DARRIN HADDAD

Antitheft Device

The hardest part of growing blueberries is keeping birds from stealing the crop. Trying to shoo them away is futile. But Russ Morash, *This Old House*'s gardener, found a solution that really works: this cage of wood and bird netting. Inside he grows five bushes, each ripening at a slightly different time. The setup allows him to harvest berries for breakfast cereal and desserts all July and August.



Love Bugs

Homeowners buy about a million bug zappers a year, but most don't work—not against biting bugs, anyway. University of Delaware researchers proved it with an actual body count. Of 13,789 insects toasted during a test, only 31 were mosquitoes and gnats. "Zappers' ultraviolet light has no effect on mosquitoes," says Paul McGuire, vice president of Dejay, a maker of zappers since the 1950s. A better lure, he says, is sex—by way of a chemical called octenol. "It's a pheromone," says McGuire, "a sex attractant that's hard to resist." Dejay's octenol-packed ML100 is a simple gadget that can hang inside almost any zapper and lasts about 30 days.

Grow to Bestow

For years, one rule of home gardening has been "grow just what you can use." Maybe it ought to be "grow enough to give away." Organizations such as Second Harvest and Plant a Row for the Hungry are moving surplus fruit and vegetables from backyard gardens to food banks. In Santa Clara, California, one group of 4-Hers even donated surplus honey. Just think what a difference a fresh crunch could make for people weary of canned carrots.

Going for the Gold

When the heat of the sun is burning the back of your neck, the lure of world recognition can make pulling weeds seem a lot more bearable. Perhaps that's why so many gardeners set out to grow the largest possible pumpkins and watermelons. Competition turns a solitary hobby into a team sport. Harry Hurley, who holds the world record for the longest bean (48¾ inches), went so far as to set up an organization for aspiring horticultural hotshots: the Giant Growers Association. It provides seed information and tips, sponsors contests and helps members qualify for those world records. To be a contender, you'd have to compete with stats like these:

CARROT: 16 LBS, 11.5 OZ (B. LAVERY OF LLANHARRY, WALES, 1985)
TOMATO: 7 LBS, 12 OZ (G. GRAHAM OF EDMOND, OKLAHOMA, 1986)
WATERMELON: 262 LBS (R. CARSON OF ARRINGTON, INDIANA, 1990)
PUMPKIN: 990 LBS (H. BAX OF LYON, ONTARIO, CANADA, 1944)

Think Fall

July is prime time to start a fall garden, but no one wants to yank out just-ripening tomatoes to make room for beet and spinach seeds. Russ Morash suggests sowing second-season seeds in pots instead. To defeat the summer sun, cover newly sown seeds with burlap and keep the fabric moist. Or shade the pots under tents made of pairs of wood shingles. In August, as the summer garden peters out, move fall plants to more spacious quarters. Autumn's too late to plant, since cool, dark days impede growth. But if crops are already fully grown, the natural refrigeration prolongs freshness.

Kid Heaven

This book has it all—forts, sandboxes, even a "water channel" that can be filled for wading and then emptied to form a decorative patio edge. There's also a chapter on ball games suitable for yards of various sizes. "If you think your plants are more important than sport, balls on elastic for the children are the answer." Produced in England, the book features lush settings and ideas that can take root anywhere.

Wipe-on Armor

What lye soap, dirt, gasoline and bleach have in common with marshmallows, molasses and horse urine is that all are folk remedies for allergic reactions to poison ivy, poison oak and poison sumac. And they seldom work. "Urushiol, the specific irritant involved, must be removed quickly," says dermatologist Boris Lushniak. "Once it penetrates the skin, you're too late." Now scratchers can try IvyBlock, the first FDA-approved "pre-exposure" lotion. It forms a protective barrier for up to four hours. Susan Carol Hauser, author of the *Nature's Revenge* guidebook to the toxic trio, recommends prevention because a reaction takes so long to subside—"about two weeks if you treat it, and fourteen days if you don't."

PHOTOGRAPHS, TOP TO BOTTOM, BY KELLER & KELLER; DARRIN HADDAD; LEN BARBIERO/THE STOCK SHOP INC. ILLUSTRATION BY STEVEN WACKSMAN

For details and sources see **Directory** on page 133

This Old House

• Indicates *This Old House Classics* vintage episodes rebroadcast on commercial stations

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WBRC-TV
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• WBMA-TV

Demopolis
WCDC-TV
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Huntsville
WHIQ-TV
Thu. 8 pm, Sat. 8 pm

Louisville
WGBQ-TV
Thu. 8 pm, Sat. 8 pm

Mobile
WEIQ-TV
Thu. 8 pm, Sat. 8 pm

Montgomery
WAIQ-TV
Thu. 8 pm, Sat. 8 pm

Mount Cheaha
WCIQ-TV
Thu. 8 pm, Sat. 8 pm

ALASKA

Anchorage
KAKM-TV
Mon. 6 pm, Sat. 9:30 am
• KIMO-TV
Sat. 5:30 pm

Bethel
KYUK-TV
Fri. 8 pm, Sat. 8 am

Fairbanks
KUAC-TV
Fri. 8 pm, Sat. 8 am
• KATN-TV
Sun. 5 pm

Juneau
KTOO-TV
Fri. 8 pm, Sat. 8 am
• KJUD-TV

ARIZONA

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KAET-TV
Thu. 8 pm and 9:30 pm
Sat. noon and 5 pm
• KPHO-TV
Sat. 9 am

Tucson
KUAS-TV
Sat. 11 am and 6:30 pm
KUAT-TV
Sat. 11 am and 6:30 pm
• KTTU-TV
Sat. 9 am

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Arkadelphia
KETG-TV
Sat. noon, Sun. 6:30 pm

Fayetteville
KAFT-TV
Sat. noon, Sun. 5:30 pm

Jonesboro
KTEJ-TV
Sat. noon, Sun. 5:30 pm

Little Rock
KETS-TV
Sat. noon, Sun. 6:30 pm

Mountain View
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Sat. noon, Sun. 5:30 pm

CALIFORNIA

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• KBCR-TV
Sun. 5 pm

Eureka
KEET-TV
Wed. 6 pm
Sat. 10:30 am
• KAEF-TV
Sun. 5 pm

Fresno
KVPT-TV
Sat. 9 am, Sun. 7 pm
• KMPH-TV

Huntington Beach
KOCE-TV
Sat. 4:30 pm

Los Angeles
KCET-TV
Sat. 5:30 pm
• KABC-TV
Sun. 6:30 am

Monterey
• KCBA-TV
Sun. 10:30 am

Redding
KIXE-TV
Sat. 10:30 am

Rohnert Park
KRCB-TV
Wed. noon, Sun. 7:30 pm

Sacramento
KVIE-TV
Thu. 8 pm, Sat. 8:30 am
• KCRA-TV
Sun. 6 am

San Bernardino
KVCR-TV
Thu. 8 pm

San Diego
KPBS-TV
Sat. 9 am
• KGTV-TV
Sun. noon

San Francisco
KQED-TV
Sat. 5 pm
• KPIX-TV
Sun. 10 am

San Jose
KTEH-TV
Wed. 9 pm, Sat. 3 pm
Sun. 5:30 pm

San Mateo
KCSM-TV
Wed. 6:30 pm, Sun. 10 am

Santa Barbara
• KSBY-TV
Sun. 3 pm

COLORADO

Boulder
KBDI-TV
Wed. 9:30 am and 5:30 pm, Sat. 5:30 pm
Sun. 4 pm

Colorado Springs
• KRDO-TV
Sun. 11:30 am

Denver
KRMA-TV
Sat. 3 pm, Sun. 5:30 pm
• KCNC-TV
Sun. 4 pm

Grand Junction
• KREX-TV
Sun. 11:30 am

Pueblo
KTSC-TV
Thu. 8:30 pm, Sat. 2:30 pm

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Tue. noon, Thu. 11 pm
Sat. 8 pm, Sun. 10:30 am

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WEDH-TV
Tue. noon, Thu. 11 pm
Sat. 8 pm, Sun. 10:30 am
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Sun. 12:30 pm

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WEDY-TV
Tue. noon, Thu. 11 pm
Sat. 8 pm, Sun. 10:30 am

Norwich
WEDN-TV
Tue. noon, Thu. 11 pm
Sat. 8 pm, Sun. 12:30 am

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• WUSA-TV
Sat. 6 am

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Sat. 8:30 pm, Sun. 5 pm

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WFTV-TV
Tue. 8 pm, Sat. 6 pm

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• WTVK-TV
Sat. 11:30 am

Gainesville
WUFT-TV
Sat. 10 am

Jacksonville
WJCT-TV
Sat. noon and 5:30 pm
• WTLV-TV
Sat. 10 am

Miami
WLRN-TV
Sun. 12 am
WPBT-TV
Sat. 5 pm
• WPLG-TV
Sun. 8 am

Orlando
WMFE-TV
Sat. 9 am and 3:30 pm
Sun. 9 am, Thu. 8 pm
• WFTV-TV
Sat. 5 am

Pensacola
WSRE-TV
Sat. 2:30 pm and 6:30 pm

Sarasota
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Sun. 10 am

Tallahassee
WFSU-TV
Sat. 11 pm and 6:30 pm

Tampa
WEDU-TV
Sat. 10 am
WUSF-TV
Wed. 9 pm
Sat. 5:30 pm
• WTSP-TV
Sun. 10 am

West Palm Beach
• WPEC-TV
Sun. 7 am

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Sat. 5:30 am

Atlanta
WABE-TV
Sat. 5:30 pm, Sun. 8 pm
WPBA-TV
Mon. 8 pm, Wed. 2 pm
Sat. 6 pm
• WXIA-TV
Sun. 6:30 am

Chatsworth
WCTP-TV
Sat. 5:30 pm, Sun. 8 pm

Cochran
WDCO-TV
Sat. 5:30 pm, Sun. 8 pm

Columbus
WJSP-TV
Sat. 5:30 pm, Sun. 8 pm

Dawson
WACS-TV
Sat. 5:30 pm, Sun. 8 pm

Macon
• WMAZ-TV
Sat. 9 am

Pelham
WABW-TV
Sat. 4:30 pm, Sun. 8 pm

Savannah
WVAN-TV
Sat. 5:30 pm, Sun. 8 pm
• WTOC-TV
Sun. 5 pm

Waycross
WACA-TV
Sat. 5:30 pm, Sun. 8 pm

Wrens
WCES-TV
Sat. 5:30 pm, Sun. 8 pm

HAWAII

Honolulu
KFVE-TV
Thu. 7:30 pm
• KHNL-TV
Sat. 9:30 pm

Wailuku
KMEB-TV
Thu. 7:30 pm

IDAHO

Boise
KAID-TV
Sun. 4:30 pm
• KTVB-TV
Sun. 10:30 am

Coeur d'Alene
KCDT-TV
Sun. 3:30 pm

Moscow
KUID-TV
Sun. 3:30 pm

Pocatello
KISU-TV
Sun. 4:30 pm

Twin Falls
KMPT-TV
Sun. 4:30 pm

ILLINOIS

Carbondale
WSIU-TV
Fri. 12:30 pm
Sat. 12:30 pm

Champaign
• WILL-TV
Sat. 7:30 am

Charleston
WEIU-TV
Sat. 9:30 am

Chicago
WTTW-TV
Tue. 7:30 pm, Sat. 5 pm
• WBBM-TV

Jacksonville
WSEC-TV
Thu. 7:30 pm, Sun. 3:30 pm

Macomb
WIPA-TV
Thu. 7:30 pm, Sun. 3:30 pm

Moline
WQPT-TV
Tue. 7 pm, Sat. 5:30 pm

Olney
WTJS-TV
Fri. 12:30 pm
Sat. 12:30 pm

Peoria
WTVP-TV
Thu. 7:30 pm, Sat. 12:30 pm

Quincy
WQEC-TV
Thu. 7:30 pm, Sun. 3:30 pm

Rockford
• WTVO-TV
Sat. 6 pm

Springfield
• WICS-TV
Sat. 7:30 am

Urbana
WILL-TV
Thu. 7:30 pm
Sun. 3:30 pm

INDIANA

Bloomington
WTIU-TV
Mon. 5 pm, Thu. 11 pm Sat. 10 pm

Evansville
WNIN-TV
Sat. 12:30 pm and 6 pm
Sun. 4:30 pm
• WTVW-TV
Sun. 9:30 am

Fort Wayne
WFWA-TV
Sat. 11 am

Indianapolis
WFYI-TV
Sat. 12 am, Sun. 7 pm
• WISH-TV
Sat. 1:30 am

Merrillville
WYIN-TV
Thu. 8:30 am
Sun. 4:30 pm

Muncie
WIPB-TV
Sun. 4:30 pm

South Bend
WNIT-TV
Wed. 7:30 pm, Sat. 2 pm
• WSBT-TV
Sat. 10:30 pm

Vincennes
WVUT-TV
Wed. 12:30 pm

IOWA

Cedar Rapids
• KWWL-TV

Council Bluffs
KIWA-TV
Fri. 6:30 pm, Sat. 1:30 pm

Des Moines
KDIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

Fort Dodge
KDIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

Iowa City
KDIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

Mason City
KYIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

Ottumwa
• KYOU-TV
Sat. 7:30 pm

Red Oak
KHIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

Sioux City
KSIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

Waterloo
KHIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

KANSAS

Bunker Hill
KOOD-TV
Thu. 7 pm, Sat. 2:30 pm

Lakin
KSWK-TV
Thu. 7 pm, Sat. 2:30 pm

Topeka
KTWU-TV
Sat. 9:30 am

Wichita
KPTS-TV
Sat. 10:30 am, Sun. 11 am
• KSNW-TV
Sun. 6:30 am

KENTUCKY

Ashland
WKAS-TV
Mon. 6:30 pm, Sun. 4 pm

Bowling Green
WKGB-TV
Mon. 5:30 pm, Sun. 4 pm
WKYU-TV
Tue. 1 pm and 6:30 pm
• WBKO-TV
Sun. 6:30 am

Covington
WCVN-TV
Mon. 6:30 pm, Sun. 4 pm

Elizabethtown
WKZT-TV
Mon. 6:30 pm, Sun. 5 pm

Hazard
WKLE-TV
Mon. 6:30 pm, Sun. 5 pm

Lexington
WKLE-TV
Mon. 6:30 pm, Sun. 5 pm
• WTVQ-TV
Thu. noon

Louisville
WKMJ-TV
Mon. 6:30 pm, Sun. 5 pm
WKPC-TV
Sat. 5:30 pm, Sun. 3 pm
• WHAS-TV
Sat. 6:30 am

Madisonville
WKMA-TV
Mon. 5:30 pm, Sun. 4 pm

Morehead
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Murray
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Sat noon

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Somerset
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LOUISIANA

Alexandria
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* WAFB-TV
Sun noon

Lafayette
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Lake Charles
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Sat 4 pm, Sun 10 am

Monroe
KTVE-TV
Sat 4 pm, Sun 10 am

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WYES-TV
Sat 8:30 am
* WVUE
Sun 6 am

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KSHV-TV
Sat 4 pm, Sun 10 am
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Sun 6 am

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WMEA-TV
Sat 10 pm
* WPXT-TV
Sun 11 am

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WMPT-TV
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Sun 7 am

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Sat 4:30 pm, Sun 6:30 pm

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Sat 4:30 pm, Sun 6:30 pm

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Thu 8 pm, Sat 5:30 pm
WGBX-TV
Sun 7 am
* WBZ-TV
Sun noon

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WGBY-TV
Thu 8 pm, Sat 5:30 pm

MICHIGAN

Alpena
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Sat 2:30 pm

Bad Axe
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Tue 2:30 pm, Sun 5 pm

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WWTV/WWUP
Sun 11 am

Detroit
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Thu 8:30 pm, Sat 11 am
* WDIV-TV
Sun 7 am

Flint
WFUM-TV
Thu 9 pm, Sat 1:30 pm
* WNEM-TV
Sun 5 am

Grand Rapids
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Thu 8:30 pm, Sat 11 am
* WOOD-TV/WOTV

Kalamazoo
WGVK-TV
Thu 8:30 pm, Sat 11 am

Manistee
WCAW-TV
Sat 2 pm

Marquette
WNMU-TV
Sat 1:30 pm

Mount Pleasant
WCMU-TV
Sat 2 pm

University Center
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Sat 2:30 pm

Brainerd
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Thu 7:30 pm
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Sat 6 pm

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* KSTP-TV
Sat 9 am

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Sat noon

Booneville
WMAE-TV
Sat 7 pm

Bude
WMAU-TV
Sat 1 pm

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* WCBI-TV
Sun 5 pm

Greenwood
WMAU-TV
Sat 7 pm

Jackson
WMPN-TV
Sat 1 pm
* WLBT-TV
Sun 6:30 am

Meridian
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Sat 7 pm

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Oxford
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Joplin
KOZJ-TV
Sat 12:30 pm

Kansas City
KCPT-TV
Thu 7:30 pm
Sat 12 noon
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Sat 6 am

St. Louis
KETC-TV
Wed 7:30 pm
Sat 6:30 pm
* KMOV-TV
Sun 6:30 pm

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KMOS-TV
Sat 12 noon

Springfield
KOZK-TV
Sat 12:30 pm

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KUFM-TV
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Sun 5:30 pm

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WNJN-TV
Tue 8 pm, Sat 5 pm
Sun 5:30 pm

New Brunswick
WNJT-TV
Tue 8 pm, Sat 5 pm
Sun 5:30 pm

Trenton
WNJT-TV
Tue 8 pm, Sat 8 pm
Sun 5:30 pm

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Sat 1:30 pm

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KENW-TV
Sat 10 am
Wed 7:30 pm

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Thu 8:30 pm
Sat 9:30 am, Sun 8 pm

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Sat 6:30 pm
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Sun 7:30 am

Norwood
WNPI-TV
Sat 9:30 am

Plattsburgh
WCFE-TV
Sun 1 pm

Rochester
WXXI-TV
Sat 9:30 am
Sun 5:30 pm

Schenectady
WMHT-TV
Tue 8 pm
Sat 9:30 am

Syracuse
WCNY-TV
Sat 9:30 am
* WTVH-TV
Sun 5:30 am

Watertown
WNPI-TV
Sat 9:30 am
* WWNY-TV
Sun 7 am

NORTH CAROLINA

Asheville
WUNC-TV
Sat 5:30 pm, Sun 9 am

Chapel Hill
WUNC-TV
Sat 5:30 pm, Sun 9 am

Charlotte
WTVI-TV
Thu 8 pm, Sat 5 pm
Sun 1 am
WUNG-TV
Sat 5:30 pm, Sun 9 am
* WBTV-TV
Sun 10:30 pm

Columbia
WUNL-TV
Sat 5:30 pm, Sun 9 am

Greensboro
* WUNG-TV
Sun 8 am

Greenville
WUNK-TV
Sat 10:30 pm, Sun 9 am
* WITN/WNCT-TV

Jacksonville
WUNA-TV
Sat 5:30 pm, Sun 9 am

Louisville
WKPC-TV
Sat 5 pm, Sun 9 am

Lumberton
WNCT-TV
Sat 5 pm, Sun 9 am

Raleigh
* WRAL-TV
Sun 7 am

Roanoke Rapids
WUNP-TV
Sat 5:30 pm, Sun 9 am

Wilmington
WUNJ-TV
Sat 5 pm, Sun 9 am

Winston Salem
WUNW-TV
Sat 5 pm, Sun 9 am

NORTH DAKOTA

Bismarck
KBME-TV
Thu 7 pm

Dickinson
KDSE-TV
Thu 7 pm

Ellendale
KJRE-TV
Thu 7 pm

Fargo
KFME-TV
Thu 7 pm

Grand Forks
KNDS-TV
Thu 7 pm

Minot
KMCY-TV
Thu 7 pm

Williston
KWSE-TV
Thu 7 pm

OHIO

Akron
WEAO-TV
Sat 11 am and 5 pm
Sun 4 pm

Athens
WOUB-TV
Sat 1 pm

Bowling Green
WBGU-TV
Sat 1:30 pm

Cambridge
WOUC-TV
Sat 5 pm

Cincinnati
WCET-TV
Thu 8 pm
Sat 9 am and 6 pm
* WCPO-TV
Sun 6 am

Cleveland
WVIZ-TV
Sun 10 am
Thu 7:30 pm, Sat 7:30 pm
* WEWS-TV
Sat 4:30 am

Columbus
WOSU-TV
Thu 8 pm, Sat 4:30 pm
* WSYX-TV
Sun 9 am

Dayton
WPTD-TV
Thu 8 pm, Sat 9:30 am
Sun noon
* WDTN-TV
Sun 6 am

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Unique base is designed to mount on 2x4's to further extend your work surface.

Extra-tall sliding fence lets you position crown moulding upright for easier cutting. Huge table combined with removable table extension and sliding fence adds up to the largest work surface of any 12" miter saw.

Easy-grip handle and electric blade brake make repetitive cuts a cinch.

Large, easy-to-read scale and a redesigned quick action miter lock make cutting fast and accurate.

The Delta 12" Compound Miter Saw provides extra, extra large capacity. Crosscut up to a 2x8 or miter up to a 4x6 in hard or soft woods. Big, beefy 15 amp motor cuts big jobs down to size.

Work clamp holds stock securely for improved safety and precision.

SLIDING FENCE ADDS VERSATILITY

INCLUDES 15 AMP. MOTOR

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Model No. 36-235

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We asked our customers out there just how they'd go about improving our 12" Compound Miter Saw. You're looking at the answer. From handle to fence to the roomiest work surface on the market, the answer was, "More, more, more." Call toll free for the name of your nearest Delta dealer. Delta International Machinery Corp., 800-438-2486. In Canada, 519-836-2840. And visit our web site at www.deltawoodworking.com.

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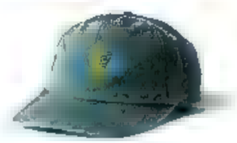
For hammering, digging, or relaxing—our favorites for any job

THE VICTORY GARDEN



Crew Caps
100% stonewashed cotton crew caps in indigo, pine green or khaki. Adjustable fabric strap with brass clasp. "The Victory Garden" embroidered on back. One-size-fits-most. *$17.95*

Logo Tees
Choose natural, iris or ash. Made in the USA of high-quality 100% cotton, in adult sizes S, M, L, XL. *$17.95*

Equalizer Tee
Gardening with an attitude. Illustrated pine green t-shirt reads "Equalizer. Terminator. Eliminator." High-quality 100% cotton made in the USA. Small. *Victory Garden* logo detail on back. Available in adult sizes S, M, L, XL. *$17.95*

To order, call toll free
1-800-255-9424

This Old House™

Tees
T-shirts are high quality 100% cotton, available in navy with white logo or white with blue logo (white has large window design on back). Made in the USA, in adult sizes L, XL. *$17.95*
XXL *$18.95*

Sweats
Sweatshirts are 80/20 cotton-poly, available in navy with white logo or ash gray with blue logo. Made in the USA, in adult sizes L, XL. *$44.50*

Baseball Caps
Made of 100% prewashed cotton, with relaxed crown and adjustable leather strap with brass clasp. Logo detail embroidered on back. Made in the USA, one size fits most. *$17.95*

duckcloth cap with cordovan crown and brown lettering

navy cap with ultrasuede visor and off-white lettering

logo detail

This Old Mug
Sip in style from this 11 oz. ceramic mug. Dishwasher and microwave safe. *$7.95*
Pair of mugs *$14.95*

tan cap with blue lettering

navy cap with off-white lettering

camouflage cap with off-white lettering

This Old House Renovation Projects Available on Video!

Tucson
Arizona Pueblo Revival
A 1930s stucco house is remodeled and expanded against a breathtaking backdrop of mountains and desert.
4 hrs. $29.95

Nantucket
Massachusetts Victorian
A small 1887 Victorian cottage is transformed into a summer home with year-round capabilities.
9 hrs. $39.95

Savannah
Georgia Victorian Row House
This historically significant 1884 row house is restored and expanded to accommodate a young family.
4 hrs. $29.95

Salem
Massachusetts Antique Federal/Victorian
A neglected 1768 Victorian gem is restored and updated inside and out.
9 hrs. $39.95

Napa Valley
California Victorian Farmhouse
This 1906 farmhouse in California Wine Country is updated and expanded to make the most of a spectacular view.
4 hrs. $29.95

This Old House and *The Victory Garden* are trademarks of WGBH Educational Foundation.

Finally! An Answer To America's Sleep Crisis!

Landmark Sleep Study Proves There Is A Better Way For Americans To Sleep!

WAKE UP TO THE FACTS!

When you wake up feeling tired and achy instead of refreshed, it's your body's way of telling you that you need a better night's sleep. It's a message you cannot afford to ignore.

National statistics say that most Americans suffer some degree of sleep deprivation with alarming consequences. Inadequate sleep leads to thousands of fatal crashes on the highway and billions of dollars in lost productivity and industrial accidents each year. Lack of sleep also means increased vulnerability to illness, loss of creativity and clarity of thinking, and increased irritability.

It's no wonder that the subject of sleep is beginning to command as much attention as diet and exercise. A good night's sleep is not a luxury – it's necessary if you want to stay healthy.

YOUR MATTRESS MAY BE ROBBING YOU OF MUCH-NEEDED SLEEP

Poor sleep can be caused by any number of factors – too much light in the room, too much noise, caffeine or alcohol intake before bed, or worry and nervous tension. But too many people ignore one, sleep bandit that's right underneath them – an uncomfortable mattress.

A comfortable mattress does two things. It supports the body's skeletal framework so that the muscles that work hard all day can relax, and it minimizes discomfort by helping to alleviate pressure on sensitive areas.

Fortunately, the mattress has come a long way since the innerspring variety was invented over a century ago.

"We see essential keys to good health – diet, nutrition, exercise and sleep. Given America's sleep crisis, finding ways to help Americans get a better night's sleep should be a national priority."

—Dr. Robert Naiman, Ph.D.
Canyon Ranch Health Resorts

WHY SLEEP ON STEEL WHEN YOU CAN SLEEP ON AIR?

Now that we understand how much a good night's sleep depends upon a comfortable, supportive bed, it makes sense that metal coils are being replaced by an advanced technology that's sweeping the nation by storm: the air-supported, adjustable firmness SELECT COMFORT® sleep system. It's so innovative, it literally redefines sleep comfort for the 21st century.

What it looks like on the outside, the Select Comfort Sleep System® is completely unique on the inside. The mattress supports the body on a cushion of air instead of springs.

Captured inside special patented chambers that contour to the body, air helps reduce pressure points and evenly distributes body weight for a better night's sleep.

What's more, the Select Comfort adjustable firmness mattress adapts to the changes your body goes through from day to day, and year to year. Just a touch of a button can make either side of the bed softer or firmer with a remote control that digitally displays the firmness level that's just right for you.

TEST SUBJECTS RAVED ABOUT NEW SLEEP SURFACE TECHNOLOGY

A recent clinical study conducted by Dr. Richard Stoohs at the Stanford University Sleep Research Center revealed that the Select Comfort Sleep System® actually gives you a better night's sleep than a premium innerspring mattress. That's good news for the millions of people who have tried everything and still suffer from problems related to poor sleep.

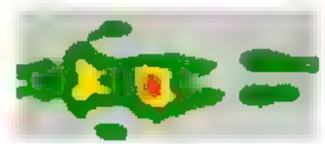
The Stoohs research demonstrates that test subjects using the Select Comfort Sleep System fell asleep faster, moved more quickly through the lighter stages of sleep and spent more time in deeper, more restorative sleep than test subjects sleeping on the innerspring. And those test subjects said they slept better when they woke up after sleeping on the Select Comfort Sleep System.

Subjects using the Select Comfort Sleep System fell asleep faster and spent more time in deeper restorative sleep.

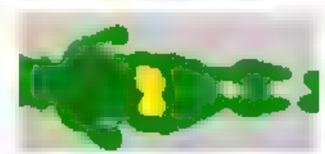
"We've known anecdotally for years that the right mattress makes a difference in how well we sleep. This study is a breakthrough, independent evidence that confirms there is a better way for Americans to sleep."

—Dr. Roman Naiman

Air helps reduce uncomfortable pressure points and more evenly distributes body weight.



Metal Coil Mattress



Select Comfort Sleep System

Light green and dark green indicate points of lower pressure. Yellow indicates somewhat higher pressure and red shows uncomfortable high pressure points.

WHEN YOUR BODY CRAVES A GOOD NIGHT'S SLEEP...GIVE IT SOME AIR

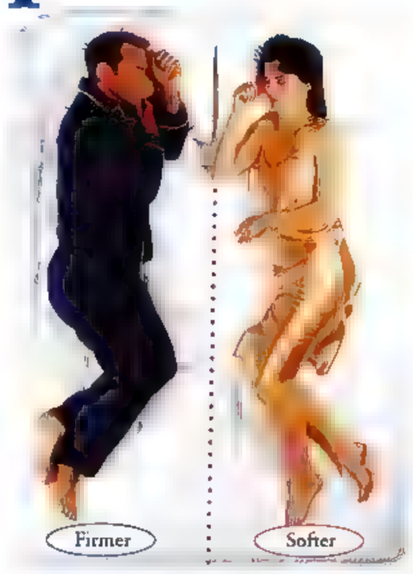
For a free introductory brochure and video – or for more information about the Select Comfort Sleep System, call 1-800-831-1211 Ext. 8533.

MONEY BACK GUARANTEE!

Sleep Better On Air!

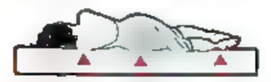
Frustrated With The Quality Of Your Sleep?

Do you toss and turn at night? Can't seem to find a comfortable position? Does your back ache when you awake? These are signs that your mattress may not be supporting you properly or be right for your body. Select Comfort can help you sleep better, with a revolutionary mattress that's so comfortable and supportive, you wake up feeling better than ever! It's not just a better mattress, it's a better way to sleep. Even back pain sufferers can sleep more comfortably on air!



With a Select Comfort Sleep System, you can each get the firmness you want.

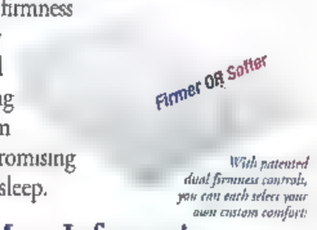
SELECT COMFORT® sleep systems comfortably contour to your body, properly support your back and spine, and reduce pressure points.



Metal coil mattresses can create uncomfortable pressure points and provide uneven support over time.

You Control The Firmness

With a Select Comfort Sleep System, you can change the firmness depending on how your body feels each night. Go from extra-firm to extra-soft, simply at the touch of a button. In fact, the firmness adjusts independently on each side of the bed so you and your sleeping partner can get custom support without compromising comfort or quality of sleep.



With patented dual firmness controls, you can each select your own custom comfort.

Sleep Better On Air

A SELECT COMFORT® sleep system doesn't rely on springs or water. Instead, it supports your body on a cushion of air. Air gently contours to your body's shape, reducing uncomfortable pressure points, and tests show it also helps properly support your back and spine. And that lowers the tension in the surrounding muscles. So you can sleep comfortably in most any position and wake feeling great!

Select Comfort mattresses contour to your body.

The Mattress With Easy Push Button Firmness Control!

Call For More Information

You owe it to yourself to learn more about this revolutionary way to a better night's sleep.

For a FREE VIDEO and Brochure, call

1-800-831-1211

Ext. 8533

Yes! Please rush me a FREE Video and Brochure.

Name _____
Address _____
City _____ State _____
Zip _____ Phone _____
x 8533

SELECT COMFORT

Mail to: **Select Comfort Direct Corporation**
6105 Trenton Lane North, Minneapolis, MN 55442

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This Old House
CLASSICS

Big Job in the Big Easy

Leaving a Boston triple-decker for a New Orleans double shotgun

Week 15 (June 28-29)

As the Jamaica Plain project begins to wrap up, Norm Abram and Steve Thomas install homeowner Hazel Briceno's new front door and a security expert explains the house's alarm system. Floor refinisher Jeff Hosking discovers that some of the floors can't be sanded and will have to be covered with painted canvas floor cloths.

The Goldens—Elvis, Jean and kids—put in more than the usual share of sweat equity.

Week 16 (July 5-6)

Norm installs vinyl tiles on the bathroom floor, and Steve helps plumber Richard Trethewey put in the kitchen sink and garbage disposal.

Week 17 (July 12-13)

Richard examines the new appliances, while Steve and Norm steal away to the International Carpentry Apprenticeship Contest in Seattle.

Week 18 (July 19-20)

Hazel gets decorating tips from the editor of *Home* magazine and spruces up the main entry foyer with stencils and a painted checkerboard floor. As the crew packs up, she welcomes her first official guest: the mayor of Boston.

Week 19 (July 26-27)

This Old House travels to New Orleans for the renovation of a 98-year-old "double shotgun" so called because a bullet fired through the front door would travel clear through the house and out the back door without hitting anything. Owners Elvis and Jean Golden plan to convert the side-by-side houses into a single home.

Week 20 (August 2-3)

As he takes down the wall separating the two houses, Norm gives Elvis a lesson in demolition, taking care to save usable moldings and trim for later. Steve takes an architectural tour of New Orleans.

Week 21 (August 9-10)

The new interior walls are framed up, just in time for the arrival of 120 sheets of drywall. To cut costs, Elvis does much of the work himself, creating bedrooms for his son and daughters.

Week 22 (August 16-17)

While Norm prepares to restore the front facade, termite inspectors check the porch and foundation for damage. Steve visits a Mardi Gras warehouse, and Richard learns how New Orleans—which sits entirely below sea level—copes with its abundance of water.

Week 23 (August 23-24)

Elvis and Steve frame the opening and install French doors leading to the rear patio. Jean gets a lesson in how to tape and mud drywall.

Norm and Steve get to work trimming clapboards for the rear of the twin houses.

Next episodes

The yard is landscaped. Norm installs the kitchen cabinets, and the house gets painted purple. A new project begins in Wayland, Massachusetts.

PHOTOGRAPHS COURTESY OF WGBH

Portsmouth
WPNH-TV
Thu. 8 pm, Sat. 4:30 pm

Toledo
WT[illegible]
Thu. 8 pm, Sat. [illegible] pm
Sun. [illegible] pm
• WTVG-TV
Sun. [illegible] am

Wheeling
• WTRF-[illegible]

Youngstown
WNEO-[illegible]
Sat. 9:30 [illegible] and 5 pm
Sun. [illegible] pm
• WYTV-TV
Sun. 10 am

OKLAHOMA

Cheyenne
KWET-TV
Sat. 9:30 am and
[illegible] pm, Sun. 4 pm

Eufaula
KVOT-TV
Sat. 9:30 am and
[illegible] pm, Sun. 4 pm

Oklahoma City
KE[illegible]-TV
Sat. 9:30 am and
[illegible] pm, Sun. 4 pm
• KOCO-TV
Sat. 10 am

Tulsa
KJRH-TV
Sat. 9:30 am and
[illegible]:30 pm, Sun. 4 pm
• KTUL-TV
Sat. 10:30 am

Corvallis
KEZI-TV
Thu. 8 pm, Sat. 5 pm

Eugene
K[illegible]-TV
Thu. 8 pm, Sat. [illegible] pm
• KLCC-TV
Sun. [illegible] pm

Klamath Falls
KFDF-TV
Sat. 10:30 am

La Grande
KTVR-TV
Thu. 8 pm
Sat. 5 pm

Medford
KMVU-TV
Sat. 10:30 am
• KDRV/KOBI-TV
Sun. 4 pm

Portland
K[illegible]-TV
Thu. 8 pm, Sat. [illegible] pm

• KOIN-TV
Sun. 10 pm

PENNSYLVANIA

Allentown
W[illegible]-TV
Fri. [illegible]:30 pm, Sat. 6 pm

Erie
WSEE-TV
Sat. 6:30 pm
• WJET-TV
Sat. 6:30 am

Harrisburg
W[illegible]-TV
Thu. 8 pm
Sat. [illegible] am, 6 pm
• WPMT-TV
Sat. [illegible] am

Philadelphia
W[illegible]-TV
Sat. 11 am and 6 pm
Sun. [illegible] pm
• WCAU-TV
Sun. 11:30 am

Pittsburgh
W[illegible]-TV
Sat. 5 pm
W[illegible]-TV
Wed. 8:30 pm, Sun. [illegible] am

University Park
WPSX-TV
Sat. 9 am and 5:46 pm
Sun. 4:30 pm

Wilkes Barre
• WVIA-TV
Sat. 2:30 pm

RHODE ISLAND

Providence
WSBE-TV
Tue. 8:30 pm, Sun. 6 pm
• WJAR-TV

SOUTH DAKOTA

Aberdeen
KDSD-TV
Sat. 4:30 pm

Brookings
K[illegible]-TV
Sat. 4:30 pm

Eagle Butte
KPSD-TV
Sat. 6:30 pm

Lowry
KQSD-TV
Sat. 4:30 pm

Marion
KZSD-TV
Sat. 4:30 pm

Pierre
KTSD-TV
Sat. 4:30 pm

Rapid City
KBHE-TV
Sat. 4:30 pm

Sioux Falls
K[illegible]-TV
Sat. 4:30 pm
• K[illegible]-TV
Sun. 9 am

Vermillion
KUSD-TV
Sat. 4:30 pm

TENNESSEE

Chattanooga
W[illegible]-TV
Sat. [illegible]:30 pm
• WRCB-TV
Sun. [illegible] am

Cookeville
WCTE-TV
Sat. 12:30 pm

Knoxville
WKOP-TV
Sat. [illegible] pm
WBIR-TV
Sat. [illegible]:30 pm
• WATE-TV
Sun. 9:30 am

Lexington
WTQF-TV
Thu. 9:30 pm
Sat. [illegible]:30 pm

Memphis
WKNO-TV
Thu. [illegible] Sat. [illegible] am
• WPTY/WREG
Sun. [illegible] am

Nashville
WDCN-TV
Sat. 4:30 pm
• WKRN-TV
Sat. 6 am

TEXAS

Amarillo
KA[illegible]-TV
Sat. [illegible] pm
• KFDA-TV
Sat. 5 pm

Austin
K[illegible]-TV
Sat. [illegible] pm

Beaumont
• KBMT
Sun. 6:30 am

College Station
KAMU-TV
Sat. [illegible]:30 pm

Corpus Christi
K[illegible]-TV
Sat. [illegible]:30 pm and 9 pm
• KIII-TV
Sun. 5 pm

Dallas/Fort Worth
K[illegible]-TV
Sat. 9 am and 6:30 pm
• KXAS-TV
Sun. 5 pm

El Paso
KCOS-TV
Sat. 5 pm
• KVIA-TV
Sat. 8 am

Harlingen
KMBH-TV
Sat. 12:30 pm

Houston
KUHT-TV
Sun. [illegible]:30 am
• KHOU-TV
Sun. 11 am

Killeen
KNCT-TV
Sat. [illegible] pm
Sun. [illegible] am

Lubbock
KTXT-TV
Sat. [illegible]:30 pm
• KLBK-TV
Sun. 5 pm

Nacogdoches
• KTRE-TV

Odessa
KOCV-TV
Sun. [illegible]:30 pm

San Antonio
KLRN-TV
Sat. 5 pm

Tyler
• KLTV-TV
Sat. 5 pm

Waco
K[illegible]-TV
Mon. [illegible]:30 pm
Sun. 9 am and 6:30 pm
• KWTX-TV
Sun. 10:30 am

UTAH

Provo
KBYU-TV
Sat. 9:30 am and 12:30 pm

Salt Lake City
KUED-TV
Sat. 9 am and 5 pm
• KSL-TV
Sun. [illegible] am

VERMONT

Burlington
WETK-TV
Thu. 8 pm, Sat. [illegible] am
• WCAX-TV
Sun. [illegible] am

Rutland
WVTB-TV
Thu. 8 pm, Sat. [illegible] am

Saint Johnsbury
WVTB-TV
Thu. 8 pm, Sat. [illegible] am

Windsor
WVTB-TV
Thu. 8 pm, Sat. [illegible] am

VIRGINIA

Charlottesville
WHTJ-TV
Sat. 8:30 am

Falls Church
WNVT-TV
Sun. 3 pm

Harrisonburg
WVPT-TV
Sat. [illegible] am

Marion
WSWV-TV
Sat. [illegible] pm

Norfolk
WHRO-TV
Thu. 8 pm, [illegible]:45 pm and
[illegible] pm
Sat. 8:30 am and 5 pm
• WAVY-TV
Sun. [illegible] am

Norton
WNSH-TV
Sat. [illegible]:30 pm

Richmond
W[illegible]-TV
Sat. 8:30 am
W[illegible]-TV
Fri. 8:30 pm
• WWBT-TV
Sat. [illegible] pm

Roanoke
WBRA-TV
Sat. 10 pm
• WSLS-TV
Sat. 6:30 am

WASHINGTON

Centralia
KCTS-TV
Thu. 6:30 pm
Sat. [illegible]:30 pm and 6 pm

Pullman
KWSU-TV
Sun. [illegible] pm
Wed. [illegible]:30 am, Sat. 2 pm

Richland
K[illegible]-TV
Thu. [illegible] pm
Sat. [illegible] pm, Sun. 4:30 pm

Seattle
K[illegible]-TV
Sun. 5 pm
• K[illegible]-TV
Sat. [illegible]:30 am

Spokane
K[illegible]-TV
Sat. 9:30 am, Sun. 5:30 pm
• KXLY-TV
Sun. 9:30 am

Tacoma
KBTC-TV
Thu. 6:30 pm
Sat. 2:30 pm and 6 pm

Yakima
KYVE-TV
Sun. 5 pm

WEST VIRGINIA

Beckley
WSWP-TV
Sat. [illegible]:30 pm

Bluefield
• WHAS-TV

Charleston
• WCHS-TV*

Clarksburg
• WDTV-TV
Sat. 6:30 pm

Huntington
WPBY-TV
Sat. 7:30 pm

Morgantown
WNPB-TV
Sat. 7:30 pm

Parkersburg
• WTAP-TV

Wheeling
• WTRF-TV*

WISCONSIN

Green Bay
WPNE-TV
Wed. 7:30 pm, Sun. 4 pm
• WLBA-TV
Sun. 7 am

La Crosse
WHLA-TV
Wed. 7:30 pm, Sun. 4 pm
• WEAU-TV
Sun. 9 am

Madison
WHA-TV
Wed. 7:30 pm, Sun. 4 pm
• WMTV-TV
Sat. 5 pm

Menomonie
WHWC-TV
Wed. 7:30 pm, Sun. 4 pm

Milwaukee
WMVS-TV
Thu. 7:30 pm, Sat. 8 am
• WTMJ-TV
Sun. [illegible]:30 am

Park Falls
WLEF-TV
Wed. 7:30 pm, Sun. 4 pm

Wausau
WHRM-TV
Wed. 7:30 pm, Sun. 4 pm
• WJFW-TV
Sun. [illegible]:30 am

WYOMING

Riverton
KCWC-TV
Sat. noon and 5 pm

*CHECK YOUR LOCAL LISTINGS

Resource Directory for Classics TV Shows

During the 1990-91 season, the crew renovated a triple-decker in Jamaica Plain, Massachusetts, and a double shotgun in New Orleans. Following is a list of some of the suppliers and manufacturers featured on those shows. (Information was correct as of the date the programs were originally broadcast.)

Week 15

Security System: Sentry Protective Systems, 110 Florence St., Malden, MA 02148, 800-445-4505.

Week 16

Vinyl tile: Components and S-225 adhesive by Armstrong World Industries Inc., P.O. Box 3001, Lancaster, PA 17604, 800-233-3823. **Kitchen sink:** Just Manufacturing Co., 9233 King St., Franklin Park, IL 60131, 847-678-5150. **Disposal:** Maytag FC-1, Maytag Appliances, 403 W. Fourth St., North Newton, IA 50208, 515-792-7000.

Week 17

Carpentry Contest: International Carpentry Apprenticeship Contest, sponsored by the United Brotherhood of Carpenters and Joiners of America, 101 Constitution Ave., NW, Washington, DC 20001, 202-546-6206.

Week 18

First-floor furniture: Lexington Furniture Industries, Bob Timberlake Collection, PO Box 1008, Lexington, NC 27293, 910-249-5300. **Second-floor furniture:** Pier 1 Imports, PO Box 961020, Fort Worth, TX 76161-0020, 817-878-8000. **Third-floor furniture:** Bernhardt Corp., Morganton Blvd. SW, Lenoir, NC 28645, 704-758-9811. **Sheets and towels:** WestPoint Stevens & Co., Inc., 1185 Avenue of the Americas, New York, NY 10036, 212-930-2000. **Shades:** Duette by Hunter Douglas Window Fashions, 1 Duette Way, Broomfield, CO 80020, 800-438-3883. **Cork wallcovering:** Vistacene colored bulletin board cork by Expanko Cork Co., Inc., Box 384, West Chester, PA 19380, 800-345-6202 or 215-436-8300. **Carpeting:** Karastan Bigelow, Mohawk Industries, 1755 The Exchange, Atlanta, GA 30339, 800-554-6637.

Week 19

Architectural consultant: New Orleans Preservation Resource Center, 604 Julia Street, New Orleans, LA 70130, 504-581-7032.

With its custom-mixed purple paint and striped porch planks, the Golden house returns to its Victorian roots.

Week 20

Lumber: Weyerhaeuser Co., Tacoma, WA 98477; 253-924-2345. **Pneumatic tools:** Stanley Bostitch Inc., 1 Briggs Dr., East Greenwich, RI 02818; 401-884-2500 or 800-556-6696.

Week 21

Drywall: National Gypsum Co., Gold Bond Division, 2001 Rexford Rd., Charlotte, NC 28211, 704-365-7300. **Shop tools:** Imported by Grizzly Imports, P.O. Box 2069, Bellingham, WA 98227; 800-541-5537.

Week 22

Pest control: Orkin, 2055 Bonn St., Harvey, LA 70058; 504-348-7701.

Week 23

French doors: Hurd Millwork Co., 575 S. Whelen Ave., Medford, WI 54451-1737, 715-748-2011. **Framing lumber:** Weyerhaeuser Co. **Drywall and materials:** National Gypsum Co. Gold Bond Division.

Program dates and times are subject to change. Please check your local listings.

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We would like to thank the following companies whose products are being used in the *This Old House* Dream House. To request product information, please see our reader service section within the magazine.

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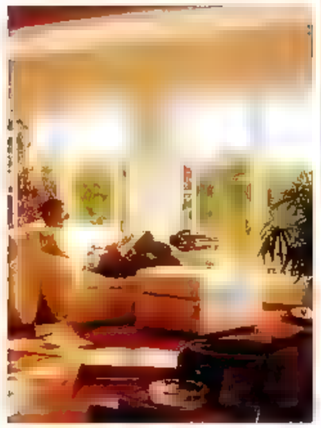

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EXTRAS *pp. 22-29*

p. 22—Pallet wood. Flooring, $3.50-$5 per sq. ft., oak, maple, cherry, bookcases, $220-$720, trestle tables, $770-$1,000; planter, $250, and benches, $520-$750. Big City Forest, 1809 Carter Avenue, Bronx, NY 10457, 718-731-3931. National Wooden Pallet & Container Assoc., 1800 N. Kent St., Ste. 911, Arlington, VA 22209-2104, 703-527-7667. **Pallet House:** The Fire Works Store, 71 Rte. 101A, Amherst, NH 03031, 603-672-8500.

p. 24—Masonry Anchors: Each comes in graduated sizes and strengths.

1. HIT short internally threaded insert, ½"x2", $13 for 10. HIT S-22/2 screen tube, $6.75 for 10 (requires HY20 adhesive, $37 for 11.1 oz., dispenser #MD2000, $66). Hilti, Box 21148, Tulsa, OK 74121, 800-879-8000.
2. EZ-T toggle anchor bolt: ¼"x3", $3.95 for 10; EZ-T Fastner Co., 3292 South Bannock, Englewood, CO 80110, 800-854-3279.
3. King-Con anchor: 4/", $25 for 100; galvanume plate, 2" diameter, $5 for 100, ITW Buildex, 1349 West Bryn Mawr Avenue, Itasca, IL 60143, 630-595-3500.
4. Tie-wire spike: ¼"x1¼", $25 for 100, Powers (Rawl) Products, Two E.B. Powers Square, New Rochelle, NY 10802, 800-524-3244.
5. Nylon sleeve, truss head: ¼"x1", $13 for 100, Star Expansion Co., Route 32, Mountainville, NY 10953, 800-247-8274.
6. Saber-tooth, snap-off self drill: ⅜", $207 for 100, Powers (Rawl) Products.
7. Kwik Bolt II expansion anchor ⅜"x2¼", 304 stainless steel, $433 per 100; Hilti.
8. Tap-Con hex washer head: 3/16"x2¼", $15 for 100, ITW Buildex.
9. Keil mechanical stainless steel anchor 5½-15 mm, $2-$3, Tile-EZ USA Inc., 11216 Tamiami Trail N, Ste. 233, Naples, FL 33963, 941-598-3737.
10. Double: 5/16", $180 per 100; Powers (Rawl) Products.
11. Flat head sleeve-grip: ⅜"x2¼", $67 per 100, Star Expansion Co.
12. Stazin lag shield: ⅜", $43 for 100, Star Expansion Co.
13. Fiberplug jute braid: 5/16" x1¼", $22 for 100, Powers (Rawl) Products.

Memo books: Doors (natural or blue-gray), $26, windows (olive or gray), $32, Flax Art & Design, PO Box 7216, San Francisco, CA 94120-7216, 800-547-7778. **Air-conditioning.** "Assessment of HVAC Installations in New Homes in Arizona" and other publications list, Proctor Engineering, 818 5th Ave., Suite 208, San Rafael, CA 94901, 415-455-5700. Manual J and Manual S, Air Conditioning Contractors of America, 1712 New Hampshire Avenue NW, Washington, DC 20009, 202-483-9370.

WGBH Educational Foundation does not endorse any product or service mentioned or advertised in this magazine.

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p. 25—Beam cutter: #PR-7000, $149, Prazi USA, 118 Long Pond Road #6, Plymouth, MA 02360, 800-262-0211. **Porch Paint:** Sean Hoolihan, Historic Charleston Foundation, 40 East Bay St., Charleston, SC 29401, 803-724-1188. **Trowel and error:** National Tile Contractors Association, 626 Lakeland Drive, Jackson, MS 39208, 601-939-2071. **Poem:** *The Spirit Level*, by Seamus Heaney, 1996, 82 pp., $18, Farrar Straus Giroux, 19 Union Sq. W., New York, NY 10003, 800-788-6262.

p. 28—Edwards Historic District: "The Edwards Family and Black Entrepreneurial Success," by Paul Lehman, *The Chronicles of Oklahoma*, Vol. 64, Winter 1986, reprint $5, Oklahoma Historical Society, 2100 N. Lincoln Blvd., Oklahoma City, OK 73105-4997, 405-522-5243. **Missile sites:** Twentieth Century Castles, 2933 SW Woodside Dr., Topeka, Kansas 66614, 913-256-6029. www.missilesite.com

p. 29—Top Banana framing hammers: 15-, 18- and 22-ounce stainless steel heads, $38-$40, standard heads, $33-$35, Ted Hammers Inc., 6152 Mission George Rd., San Diego, Cal. 92120, 800-645-2434. **Basement book:** *The Original Basement Waterproofing Handbook*, by Jack Masters, 1996, $31.95 includes shipping & handling, 322 Mall Blvd. #227, Monroeville, PA 15146, 412-860-4663, www.sgi.net/handbook/. **Model House:**

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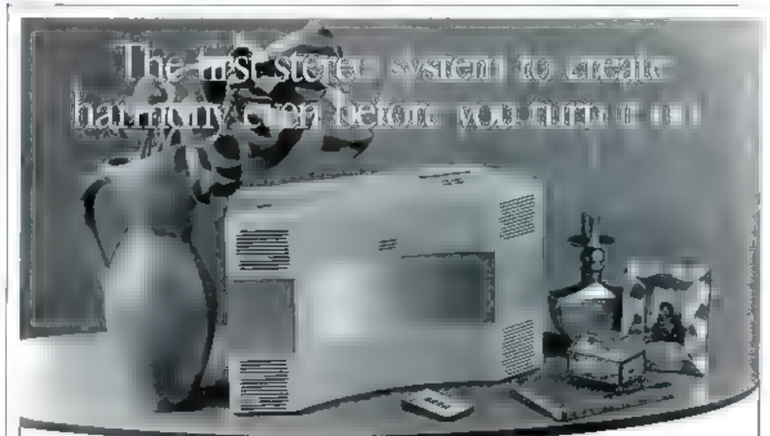

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Frank Lloyd Wright's Robie House by E V Gillon Jr , 1987, 15 pp plus 15 cut out plates, $6 95, Dover Publications Inc , 31 East 2nd Street, Mineola NY 11501, 516-294-7000 Doorbell, Westminster, $825-$1,300, Oxford Chime Works 207 E Main St , Rogersville, TN 37857, 423-272 0855

POWER WASHERS *pp. 31-38*

Power washers: #DDE3000, $2 800, #TE100-10, 10 foot telescoping extension, $215, Simpson Cleaning Systems, 1500 North Belcher Road, Clearwater, Florida, 34625, 800-237-5918 Triplex Pump: #T201 , $742, General Pump Inc , 1174 Northland Drive, Mendota Heights, MN 55120 612 454-6500 Electric washer #520M, 1,300 psi, $479, Karcher Inc., 1600 Cottonta Lane, Somerset, NJ 08875, 908 356 1199 Accessories:) #VT500-00 Vari Tip nozzle, $61, (2, #WB 800-02 Water Blaster nozzle, $138 3) #SB540-16 ceramic sand nozzle, $6, #SB524-00 entire sandblaster (not shown), $225 4) #CN 304 cleaning nozzles with color-coded plastic tips, $46 per set of 4, or $12 50 each (5) #CN904 cleaning nozzles with stainless steel tips, $51 per set of 4 or $14 each (6) #SC440-65 control nozzle for chemical injector, $11, #SC 251-01IP, chemical injector (not shown , $90 (7 #SC 375 50 (52, $4), control nozzle for acid injector $2 60 each #SC 371 0, acid injector (not shown), $248 8 #SVP 100-20 Super Sucker vacuum pump, $125 49 #PB100-2e power scrub brush $125, Simpson Cleaning Systems

Our thanks to Richard Vilentine, advertising director, Simpson Cleaning Systems Shallu Singh, Karcher Inc C Michael Lund product line manager, Al Seasny R&D supervisor, General Pump Inc , 1174 Northland Dr, Mendota Heights, MN 55120, 800-474 5487

CYPRESS *pp. 40-44*

Sinker cypress. What It's Worth Inc , PO Box 162135, Austin, TX 78716, 512 328 8837 Goodwin Heart Pine Co , 106 SW 109th Pl , Micanopy FL 32667, 352 466 0339 New cypress Barnes Lumber Manufacturing Inc , PO Box 1383, Statesboro, Georgia, 30459, 912 764 8875

Recycled cypress: Cartwheel Sawmill, 494 Thomas Landers Rd , East Falmouth, MA 02536 508 457 9239

Our thanks to Harry Aden and Regis Miner, botanists, USDA Forest Products Laboratory, Madison, WI Dr Richard Jagels, chairman, Department of Forest Ecosystem Science, University of Maine, Orono, ME Thomas E Clark Leeds Clark Inc , Midlothian, TX Bruce Kruger, Nantucket, MA David Muth, Lafitte National Historical Park and Refuge, New Orleans, LA Bob and Judy Brinc Statesboro, GA

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SAWHORSES *pp. 45-48*

Recycled plastic: #10006, $35 per sawhorse, Storehorse Inc., 16607 Blanco Rd., Suite 100, San Antonio, TX 78232, 800-555-9753. **Galvanized steel:** #SH32, $16 per sawhorse, Crawford Products, 301 Winter Street, West Hanover, MA 02339, 800-225-5832. **Maple:** Porta-Foldable Workhorse, $149 per pair, Artwood Industries, PO Box 350, Somerset, PA 15501, 888-278-2010. **Tubular steel:** adjustable sawhorse workstand, $74-$89 per sawhorse, Stamar Tools Inc., 6152 Somerville Valley Road, Ellicottville, NY 14731, 888-989-9924. **Steel with powder-coated finish:** Tote-a-Horse portable sawhorse, $60 per pair, Thoroughbred Sawhorses and Equipment, Fulton Corp., 303 Eighth Ave., Fulton, IL 61652, 800-252-0002. **Steel with baked enamel finish:** #32N62, portable interlocking sawhorses, $67.50 per pair, Woodcraft, Box 1686, Parkersburg, WV 26102-1686, 800-225-1153. **Attachable tubular steel legs:** Rugged Buddy, $40 per pair (one sawhorse), SRD Metal Products Inc., 13306 Halldale Ave., Gardena, CA 90249, 310-532-4421. **Galvanized steel legs:** #SH30, $12.50 per pair (one sawhorse), Crawford Products.

SHOVELS *pp. 50-53*

Rabbiting: #RAB Sheffield Pride rabbiting spade, $46, Kinsman Company Inc., River Road, Point Pleasant, PA 18950, 800-733-5613. **Forged:** Spear and Jackson forged standard digging spade, $59.95, Walt Nicke's Garden Talk, Box 433, Topsfield, MA 01983, 508-887-3388. **Drain:** #13-445 Tiger Plus drain spade, $58, Ames Lawn and Garden Tools, Box 1774, Parkersburg, WV 26102, 800-624-2654. **Nonsparking:** #7A-30855, Ampco copper alloy nonsparking square point shovel, $146.05, Lab Safety Supply, Box 1368, Janesville, WI 53547-1368, 800-356-0783. **Fluted:** #15-772 DigEzy (now called Kodiak) serrated garden spade, $33, Ames Lawn and Garden Tools. **Aluminum square-point:** #16-341, Little John scoop, $33, Ames Lawn and Garden Tools. **Round-point:** #13-442 Tiger Plus round point shovel, $51, Ames Lawn and Garden Tools. **Sifting:** #550, perforated shovel, $55, Gempler's, 211 Blue Mounds Road, PO Box 270, Mt. Horeb, WI, 53572, 800-874-4755. **Long-handled:** #71-83861, Craftsman round-point shovel, $20, Sears, 7 Backus Ave., Danbury, CT 06810, 203-798-3755. **Toothed:** #3757P Can-D-g-It shovel, $29.95, Jackson & Perkins, 2518 S. Pacific Highway, Medford, OR 97501, 800-292-4769. **Plastic Scoop:** #16-800 ABS-poly scoop, $29, Ames Lawn and Garden Tools. **Emergency:** #71-08278 Craftsman Car'n Garden Mate emergency shovel, $8, Sears, Danbury, CT.

Directory

SKYLIGHTS *pp. 54-60*

Skylights: #VS306 (30⅛"x47⅜") ventilating skylight with clear insulated glass, $329. #FS 101 (21.5 inch by 27.5 inch), fixed skylight with clear insulated glass, $126. #VS 101 vent-lating skylight with clear insulated glass, $264. #PFF 101 manual venetian blind, $69. #KES 310, electric control system with rain sensor, $279; #KEM 140, skylight motor, $103. #FME 1000, electric pleated shade, $192. #KEZ 505, infrared remote control, $49. All from Velux-America Inc., PO Box 5001, 1418 Evans Pond Rd., Greenwood, SC 29648, 800-283-2831. **Cutaway:** Fixed skylight sample provided by Andersen Corporation, 100 Fourth Ave. North, Bayport, MN 55003, 612-439-5150. **Urethane foam:** Touch 'n Foam minimal expanding sealant, $9, Convenience Products, 866 Horan Dr., Fenton, MO 63026-2416, 800-325-6180. **For more information:** National Wood Window and Door Association, 1400 E. Touhy Avenue, Suite 470, Des Plaines, IL 60018, 847-299-5200.

Our thanks to: Randy S. Smith, P. Eng., Agra Earth & Environmental Ltd., Calgary, Alberta, Canada; Paul Denys, Denys Builds Designs, Ottowa, Ontario, Canada; Leslie Southard, Velux America Inc.; Steve Berg, marketing manager, Andersen Corp.; Pamela Visel, marketing manager, Roto Frank of America Inc., Chester, CT.

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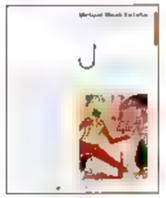
FINANCES
pp. 67-69

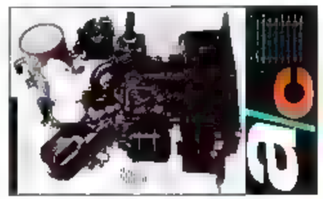


Our thanks to: Prof. Arthur Cox, Director, Real Estate Program, University of Northern Iowa, Cedar Falls, IA

TUCSON FINALE
pp. 74-81

The crew. Tom Higgins, landscape coordinator; Alexandra Hayes, architect; Tom McCaleb, general contractor; Greg Gotsch, job foreman; Dan LaBlue plumber; David Kelley, tiler; Tom Khjian library cabinetmaker; James Vosnos, mesquite cabinetmaker; Dean Carson, concrete floors; Gilberto Chavez, plasterer. **Gas Barbecue:** #DCS36, BQars grill with rotisserie, $2,600, Dynamic Cooking Systems, 10850 Porta Drive, Los Alamitos, CA 90720, 714 220-9505. **Lap Pool,** standard 7'x14' with underwater swim mirror, attachments, retractable security cover, swim current speed gauge, $14,900, Endless Pools Inc., 220 E. Dutton Mill Rd., Aston, PA 19014-9944, 800-732-8660

AIR-CONDITIONING
pp. 82-87



Equipment: Triathlon natural gas heating and cooling system, York International Corp., 631 South Richland Ave., York, PA 17403, 717 771-7890. **Installation,** $1,500-$2,000, Crums Climate Control, 1895 W. Kentucky Ave., Winter Park, FL 32789, 407-644-6601

CHICKEN COOP
pp. 88-93

Carpenter: Mark DeMichele, 87 Washington Avenue, Hastings-on Hudson, NY, 914 478-5139

Chicks. Araucana pullet (female), $56.50 for 25 (minimum order). Other types also available, Murray McMurray Hatchery, PO Box 458, Webster City, Iowa 50595, 800-456-3280

Further reading: *Raising Poultry the Modern Way,* by Leonard S. Mercia, revised 1990, 234 pp., $12.95, Storey Communications Inc., Schoolhouse Rd., Pownal, VT 05261, 800-441-5700

Chickens in Your Backyard: A Beginner's Guide, by Rick and Gail Luttmann, 157 pp., $11.95, Rodale Press, 33 E. Minor St., Emmaus, PA 18049, 800-848-4735. *The Family Poultry Flock,* edited by Lee Schwanz, 1987, 161 pp., $7.08 incl. shipping, Farmer's Digest, avail. from Murray McMurray Hatchery. *Poultry Press,* a monthly newspaper, $16 annual subscription, PO Box 542, Connorsville, IN 47331, 317 827-0932

For more information: American Poultry Association, 133 Millville St., Mendon, MA 01756, 508 473-8769. Annual membership, $10, includes yearbook, four newsletters, ability to win points at poultry shows. American Bantam Association, PO Box 127, Augusta, NJ 07822, 201 383-6944. Annual dues, $15, includes yearbook and quarterly newsletters

MASTER FRAMER
pp. 94-99

Framer: Robert Reade, Eastland Vocational, 4465 S. Hamilton, Groveport, OH 43125

Further reading: *Carpentry,* by Leonard Koel, 1991, 721 pp., $41, American Technical Publishers, 1155 W. 175th St., Homewood, IL 60430, 800-323-3471

For more information, Qualified Framer Training Program, Carpentry Training Hotline, 800-433-8736. Administered by the Industry Education Alliance, a project run jointly by the National Association of Home Builders and PAVE, 210 N. Washington St., Alexandria, VA 22314

Our thanks to: Gary Dunlap, Builder Inc., New Albany, OH; Jud and Cindy Voorhees, Galena, OH; Steve Larson, project manager, Derby Homes, Columbus, OH; Mindy M. Williams, marketing specialist, PAVE

MEXICAN TILE
pp. 100-109

Tiles: Jose Carmen Manzano Talavera y Rusticos factory, C. Posta 37800, Colonia

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Pretoria, Dolores Hidalgo, C.I.N., Guanajuato, Mexico. Tile catalogs and information in English available from: EVOS, 907 Zaragoza St., #40A SMA, Laredo, TX 78040, phone in Mexico 011-52-415-24477, fax 011-52 415 24528, e-mail, evos@mpsnet.com.mx

Further reading: *Tile*, by Jill Herbers, photographs by Roy Wright, 1996, 192 pp., $35, Artisan, a division of Workman Publishing Co., Inc.), 708 Broadway, New York, NY 10003; 800-722-7202, ext. 7558. *Tradition of Craftsmanship in Mexico*, by Patricia O'Gorman, 1988, 258 pp., $40, Architectural Book Publishing Co. Inc, 10 W. 15th St., Suite 2116, New York, NY 10011, 212 255 4374

Azulejos/Tiles, published by Artes de Mexico, Number 24, May/June 1994, 80 pp., illustr., $12 plus $18 shipping, Plaza Rio de Janeiro 52, Colonia Roma, 06700, Mexico, D.F., 011-52-5-525 5905, fax 011 52 5 525 5925

Our thanks to: Talavera San Gabriel, tile factory and Cecilia Hernandez, Mexhapatr tile showroom and distributor, Dolores Hidalgo, Guanajuato, Mexico.

DREAM HOUSE *pp. 110-115*

Our thanks to: Virginia Devine, Milton, MA. Paul Spurling, president, Sparling Thomas Period Homes, Framingham, MA.

HINGE POSTER *p. 117*

Hinges are listed as numbered on the poster. All prices are per pair unless otherwise indicated.

4. #325C, Victorian, cast iron, $8.90 each,
28. #325C, solid brass adjustable spring, $48.25,
14. #183A, brass-plated butterfly, $5.25,
42. #176H, solid brass parliament, $66,
27. #199C, solid brass strap, $60.50,

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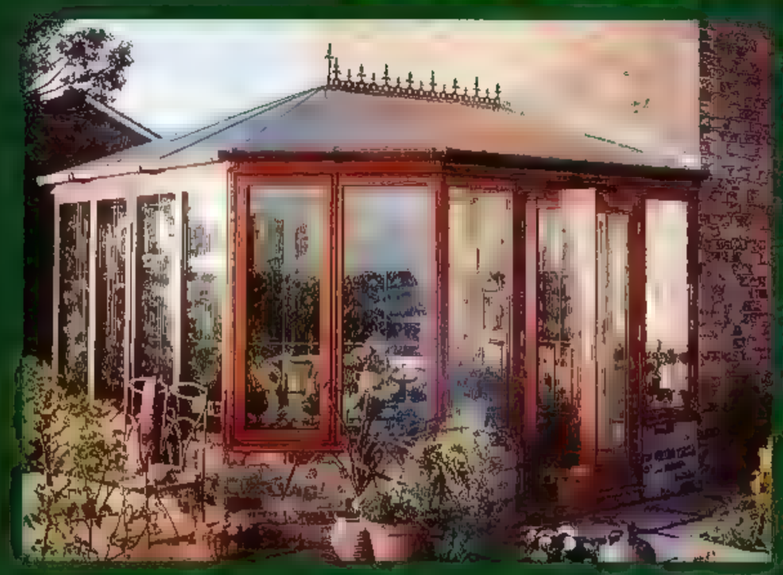

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36. #92768, undrilled walnut butt, $10,
35. #64733, solid brass semi-concealed jewelry box, $15,
34. #11099, Brusso solid brass quadrant, $26,
31. #19910, solid brass piano hinge, 24", $18 each,

All from The Woodworkers' Store, 4365 Willow Drive, Medina, MN 55340; 800-279-4441

41. #H260 066, solid brass parliament, $76.25,
24. #H41-BOO, iron rattail with high B flush mounting, $20,
45. #H1190-001, Acme cast iron self holding shutter, $15.60,
12. #X1081 C08, hand-forged iron strap with C pintle, $51.35,
13. #H38-C96, hand-forged iron butterfly hinge, $38.65,
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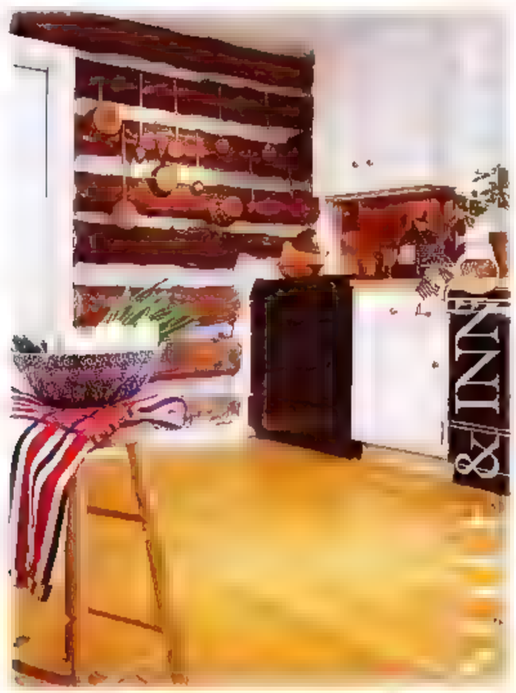

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2. Baldwin solid brass ball bearing butt with satin chrome finish, $43.65,
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37. solid brass concealed barrel hinge, $5.78 each,
All from Simon's Hardware and Bath, 42 Third Avenue New York, NY 10016, 212-5329220 (in NYC) or 800-232-9220
22. Liberty concealed surface mount, $12.58
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30. #80-3250 solid brass broad, $4,
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10. #04 0294, hand-forged solid brass olive knuckle, $137,
11. #14-1500, zinc plated utility strap, $2,
6. #53-0779 satin brass finish with adjustable spring, $14;
7. #46 3040 satin brass finish with double acting spring, $17,
All from Stanley Tools, hardware division, 600 Myrtle St., New Britain, CT 06053 800-262-2161
25. #83891 solid brass flowered icebox $7.15 Van Dyke's Restorers, Box 278, Woonsocket, SD 57385, 800-843-3320
26. #H 6 solid brass large flush $19.56,
5. #H 11 solid brass Eastlake butt, $33.52;
Both from A Carolina Craftsman, 975 South Avocado Street, Anaheim, CA 92805, 714-776-7877
43. #21036 black anodized aluminum shutter strap with pintle, $7.95, Renovator's, PO Box 2515 Conway, NH, 03818-2515, 800-659-2211

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SPRINKLERS *pp. 119-121*

Our thanks to: Roger Cook, K&R Tree & Landscape, 6 Park Dr., Burlington, MA 01803, 617 272-6104
Gary Capstock, Turf Products Corp., 157 Moody Road, Enfield, CT 06083
The Sprinkler House, 198 W. Central St., Natick, MA 01760, 508 650-9705
For more information: The Irrigation Association, 8260 Willow Oaks Corporate Drive, Suite 120 Fairfax, VA 22031; 703-573-3551, Web site www.irrigation.org. Rain Bird Technical Service, 7590 Britannia Court, San Diego, CA, helpline 800-724-6247, fax 800 232 9472, Web site www.rainbird.com. The Toro Co. Irrigation Division, Box 489, Riverside, CA 92504, helpline 800 664 4740, Web site www.toro.com/sprinklers. Form to mail in available at www.lawngene.com

PAY DIRT
pp. 124-125

Blueberries. *Grow the Best Blueberries,* by Vladimir G. Shutak & Robert F. Gough, 32 pp., $2.95, Storey Communications Inc., Schoolhouse Road, Pownal, VT 05261, 800-827-8673
The Back Yard Berry Book, by Stella Otto, 1995, 284 pp., $15.95, OttoGraphics, Maple City, MI; available from Chelsea Green Publishing, 10 Water St., Lebanon, NH 03766, 800-639-4099 **Slugs** $10 each, Perrino Mostarino invertebrate supplies, PO Box 20721, Los Angeles, CA 90006, 213-227-6566

Further Reading: *Field Guide to the Slug,* David George Gordon, 1994, 48 pp., $6.95 Sasquatch Press, 1008 Western Ave., Seattle, WA 98104, 800-775-0817
For more information. Western Society of Malacologists, 2975 B St., San Diego, CA 92102 **Our our thanks to:** Dr. Paula Mikkelsen, American Museum of Natural History, New York, New York
Giant vegetables: Giant Growers Association, annual membership $25, includes quarterly newsletter, growing

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information and contest eligibility PO Box 37457, Raleigh, NC 27627-7457, 919-639-2644 or 919-557-5946, Web site http://www.weeksseeds.com

For more information on world record qualifications, *The Guinness Book of World Records*, 33 London Rd., Enfield, Middlesex, EN2 6DJ, England, phone 011 44 171 891 4567, fax 011-44-171 891-4504

Poisonous plants. IvyBlock, $14 per 4-oz. bottle, EnviroDerm Pharmaceuticals Inc., PO Box 32370, Louisville, KY 40232-2370, 502-634-7700

Nature's Revenge: The Secrets of Poison Ivy, Poison Oak, Poison Sumac and Their Remedies, by Susan Carol Hauser, 1996, 128 pp., $13.95, Lyons & Burford Publishers, 31 W. 21st St., New York, NY 10010, 800 836-0510

Mosquito lure: ML100, for electric bug zappers, $3.99, Dejay Corp., 1750 Hal Henard Rd., Greeneville, TN 37743, 800-735-9636

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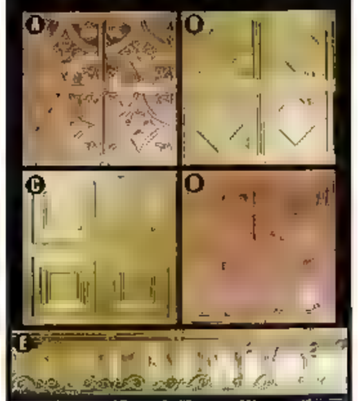

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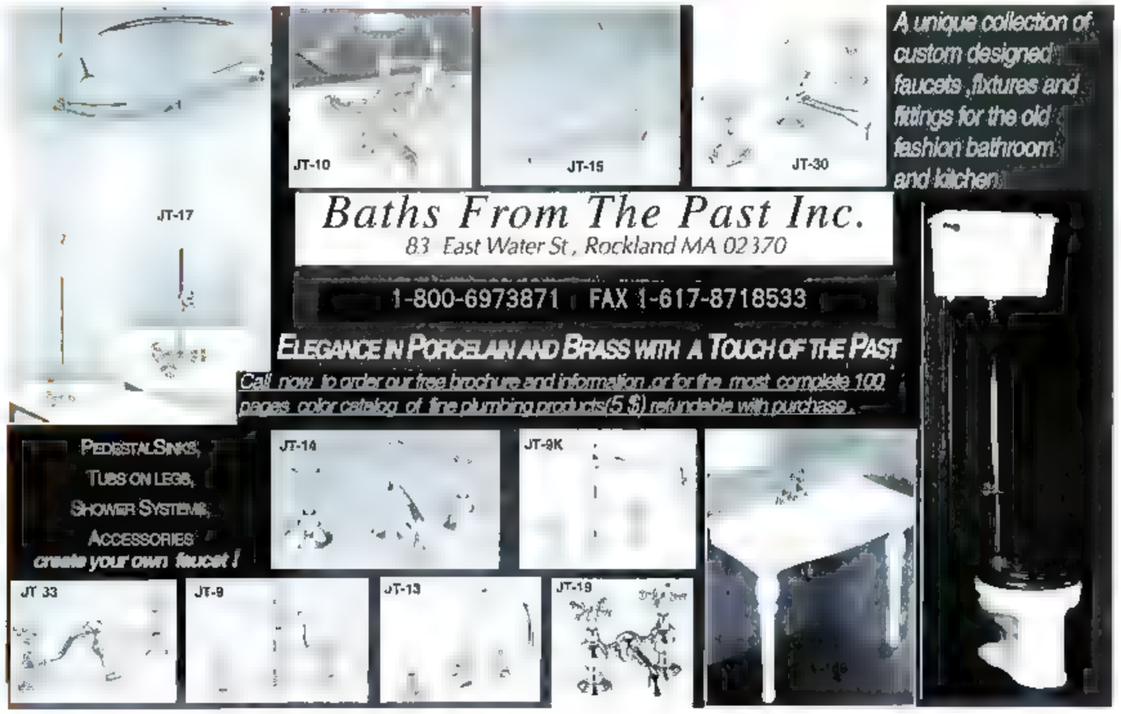
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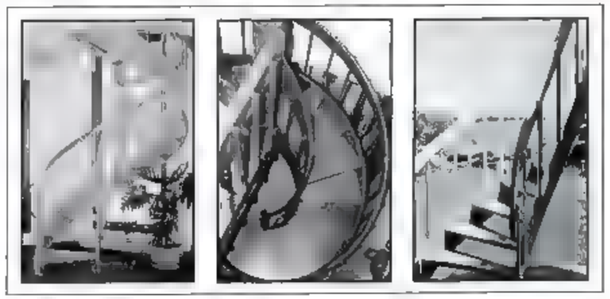

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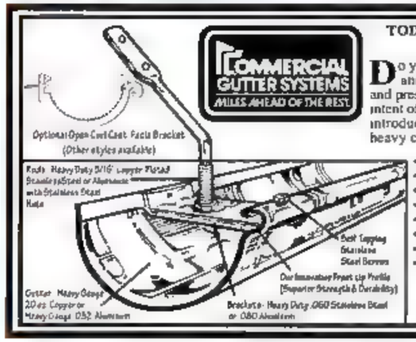
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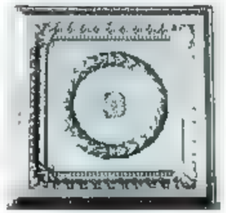

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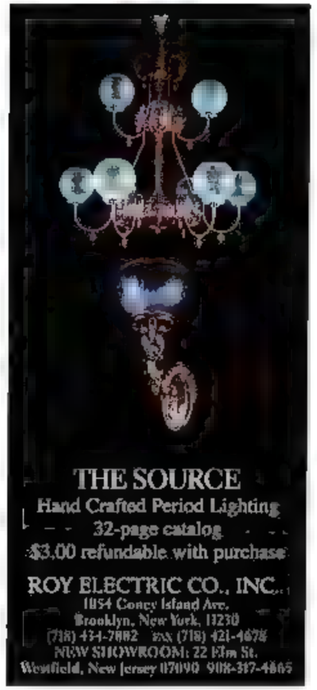

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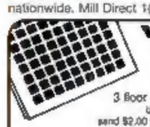

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CONTACT

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Vincennes, IN 47591-5201
812-888-5794

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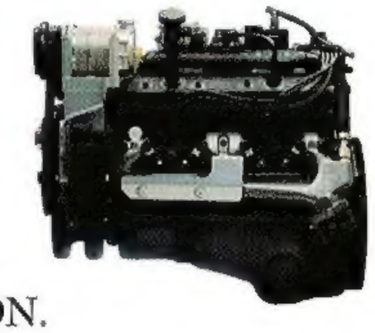

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